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NEWSPAPER

Honeywell surrenders info group

Foreign control endorsed by some users but comes too late to win back defectors

By Donna Raimondi and Rosemary Hamilton

Honeywell, Inc.'s plans to give up controlling interest of its Information Systems division through a joint venture plan involving two foreign computer vendors received cautious support from the firm's customer base last week.

However, a number of Honeywell users who have recently opted to drop the company in favor of IBM or compatible vendors expressed doubts that the joint venture with Paris-based Compagnie des Machines Bull and Japan's NEC Corp. will improve Honeywell Information Systems' stance in the computer systems market.

Most of the 15 Honeywell users contacted by *Computerworld* last week said they have no major fears about their supplier falling into the hands of foreign companies but indicated instead that they believe a stronger and more committed vendor will result from the consortium headed by Bull.

However, four of the users said the announcement was irrelevant because they are already in the process of converting to other vendors.

"Bull is in the commercial marketplace only, while Honeywell has wondered for years if it is or not," said Roland Kelley, director of MIS at Demoulas/Marketbasket, Inc., a supermarket chain based in Tewksbury, Mass.

Demoulas has had Honeywell equipment for 15 years and is "60% sure" it will stay with the company in the future, Kelley said. "With Bull in control, there will be better products and a more positive marketing philosophy."

Skepticism evident

From the group of users surveyed, some skepticism emerged.

"If the merged companies leave Honeywell's present management in charge, it will take too long to turn the company around," Kelley remarked. "They are not a No. 1 company, and they need to try harder, like Avis."

Four of the customers sur-

See **FOREIGN** page 6

Bull to call shots in deal cemented with bargain price

By Clinton Wilder

MINNEAPOLIS — Marking the year's second major restructuring within the ranks of the BUNCH companies, Honeywell, Inc. last week said it will sell off most of its computer business to a joint venture with Japan's NEC Corp. and France's Compagnie des Machines Bull.

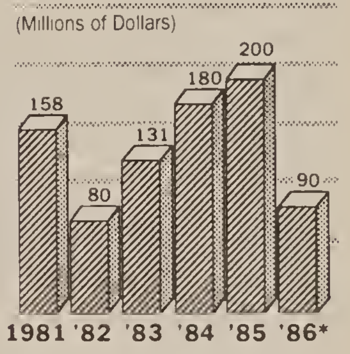
Honeywell had previously announced the triownership negotiations [CW, Sept. 29], but Honeywell's lower than expected selling price for the business indicated the company's haste to shed its computer operations, analysts said. Bull and NEC will pay less than $200 million for 57.5% of the company formed from most of Honeywell Information Systems; that price is $250 million less than book value, which will cause Honeywell to report a loss as high as $200 million for the year.

"It looks like Honeywell wanted out of the computer business pretty badly," said Steven Milunovich of First Boston Corp. "The new venture makes sense for repositioning the business, but people are pretty disappointed with the price."

A spokeswoman said the book value discount constituted "what the partners considered fair market value for the business."

MITCHELL J. HAYES

Honeywell Information Systems Group
Operating profits



* 1986 projections provided by Dain Bosworth, Inc. 1981-'85 figures rounded off from Honeywell reports

The structural details of the new company, whose name will be announced later, will be finalized by March 31, 1987.

Honeywell and Bull will each hold a 42.5% equity share, with NEC owning

See **BULL** page 7

United schedules 9370s for Xmas

By Stanley Gibson

Jumping the gun on its announced timetable, IBM is set to deliver the first of its 9370 machines this month, six months ahead of schedule.

When the 9370 departmental systems were announced Oct. 7, IBM said field tests were scheduled for February 1987, and pilot tests were not slated until the second quarter of 1987. However, United Airlines said last week it expects to take delivery of several 9370s before the year is out.

An IBM Information Services Group spokesman confirmed the delivery schedule and said United is "the first 9370 customer" and "an early pilot of the 9370." He said United would eventually use a large number of the systems and would receive them according to a staggered delivery timetable.

An IBM Federal Systems Division spokesman stressed the fact that the United installation would be a pilot test carried out by a customer and not a vendor-conducted beta test. "It's their test, not ours," he said.

The early shipment is consistent with a recent IBM trend of announcing products with extended delivery schedules only to later drastically speed up commercial availability. Most customer shipments of IBM 3090 systems were speeded up by several months from the timetable given in initial announcements.

The early deliveries would also seem to diminish initial criticism that the delivery of 9370 systems would be too far down the road to make an impact on the mid-range systems market and the increasing success of Digital Equipment Corp. in that market.

The systems will be used in United Airlines' Apollo internal reservation system and in its Enterprise travel agency automation system. Several travel agencies participating in the test will take delivery of 9370s in December, according to Henry Feinberg, director of marketing for Apollo Services.

The Apollo and Enterprise systems are being developed by United Airlines' Apollo Services unit, which will be spun off as a subsidiary of United Airlines Jan. 1. Apollo Services will sell hardware and software products to the travel industry, including a computerized reservation service for some 650 airlines.

See **UNITED** page 12

Two 'open' Macs, laser printer due in January

By Peggy Watt

CUPERTINO, Calif. — Apple Computer, Inc. will introduce at least two Motorola, Inc. 68020-based, open architecture models of the Macintosh and a low-end Laserwriter printer at the company's traditional January product unveiling, according to sources who have seen the products.

The existing Macintosh Plus cannot be upgraded to the new systems because the main logic board and power supply are different, according to independent software developers and an Apple source.

The Macintosh systems will each have 256K bytes of

See **MACS** page 4

Compilers allow programs to exploit 80386 address space

By Douglas Barney

SANTA CRUZ, Calif. — Metaware, Inc. last week announced a C compiler and a Pascal compiler that allow programs to take advantage of the large address space of Intel Corp.'s 80386 microprocessor. The compilers are currently shipping and sell for $895 each.

The Metaware compilers were designed to work with an environment provided by Softguard Systems, Inc., which is developing VM/386, a multitasking operating system for the 80386; VM/Run, a runtime monitor; and VM/Debug, a 386 debugger.

Prior to the Metaware announcement, users and developers interested in tapping the power of machines based on the 80386 had to either wait for future operating systems or write for Unix and its derivatives.

In fact, most early users of 386-based machines are still running programs designed for less powerful machines and are simply taking advantage of the increased speed of the latest Intel processor.

With the Metaware compilers, many existing programs written in C or Pascal can be recompiled to take advantage of much of the 4G-byte linear address space, dubbed protected mode, of the 386.

> ”
>
> *'With Metaware and a 386 machine, there is nothing in the world to keep people from porting their mainframe applications to a $13,000 machine.'*
>
> — Bruce Montague
> Interconnexion, Inc.

"I have done exactly that. Programs port very straightforwardly to run under Metaware 386," said Bruce Montague, a Metaware informal beta tester and senior software engineer for Interconnexion, Inc., a subsidiary of Digital Research, Inc.

Programs, however, must reach certain requirements in order to port easily to the 386 environment. "If it is a small model, you are in trouble," Montague added. Small-model programs address only 64K-byte memory segments, while large-model programs address more than 64K-byte segments, Montague said. Large-model programs port easily to 386 protected mode, Montague said.

In addition, the programs taking advantage of the 386 protected mode can continue to be run under Microsoft Corp.'s MS-DOS operating system.

In order to run the 386 protected-mode programs under MS-DOS, the user must also have the environment provided by Softguard.

"We produce the compiler and the runtime libraries that work in a suitable environment. The environment is being supplied here by Softguard and allows you to run protected-mode programs on top of MS-DOS," said Thomas Pennello, vice-president of Metaware.

"When your program makes an MS-DOS call, thinking that MS-DOS is below it, the Softguard environment traps the call, steps back down into 8086 mode and does the call for MS-DOS, then comes back to protected mode again," Pennello stated.

So far, Montague is satisfied. He has used the Metaware 386 C compiler on a Compaq Computer Corp. 386 machine "with no serious problems. On the 386 Compaq machine, it is a good fit," he reported.

Montague is unaware of any other C compilers that allow programs to take advantage of the 80386 protected mode. "That is why I got involved with it." Montague is not currently running his 32-bit code under MS-DOS.

Montague said he is using the compiler to develop future operating systems software for the 386. "We are writing 386-specialized operating systems at this point. We have been using it to actually write 386 operating system code." Montague declined to be more specific. Digital Research "is basically going to be using Metaware as its language house," Montague said.

Products such as the Metaware compilers may open up new uses for microcomputers.

"The key advantage is the 386 linear address space. If you are doing modeling or computer-aided design and manufacturing work, you have got to have a large address space. That is an awful lot of data," Montague said.

Mainframe vendors may also be interested in such products. Mainframe vendors "will now be able to take their entire package, with all the mainframe features, and put it in a 386-type environment," Montague said. "With Metaware and a 386 machine, there is nothing in the world to keep people from porting their mainframe applications to a $13,000 machine."

In conjunction with the Metaware announcement, Softguard Systems announced the Metaware compilers will be available as part of the company's DOS Developer's Tool Kit, which also includes an 80386 assembler and linker from Phar Lap Software, Inc., as well as Softguard's Runtime Monitor and VM/Debug and 80386 protected-mode debugger. The tool kit will ship in January and will sell for approximately $2,000.

CORRECTIONS

"Long-awaited McDonald's ISDN trial to start in two weeks," [CW, Dec. 1] referred to the central office switch used in the trial as a Northern Telecom, Inc. DMS-100. The switch being used is an AT&T 5ESS switch.

Genesys Software Systems, Inc. human resource systems run only on IBM mainframes, not smaller processors, as stated in "Genesys development system allows customer modifications" [CW, Nov. 24].

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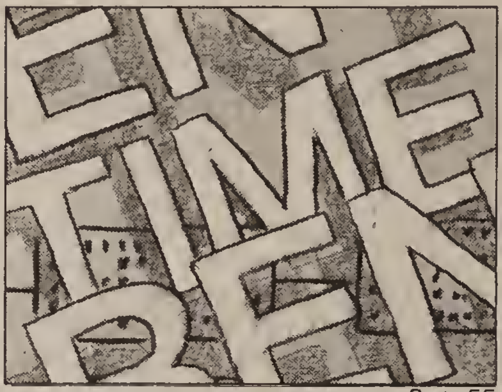

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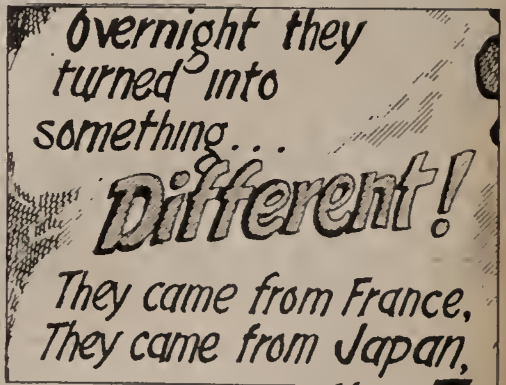
Overnight they turned into something...
Different!
They came from France,
They came from Japan,

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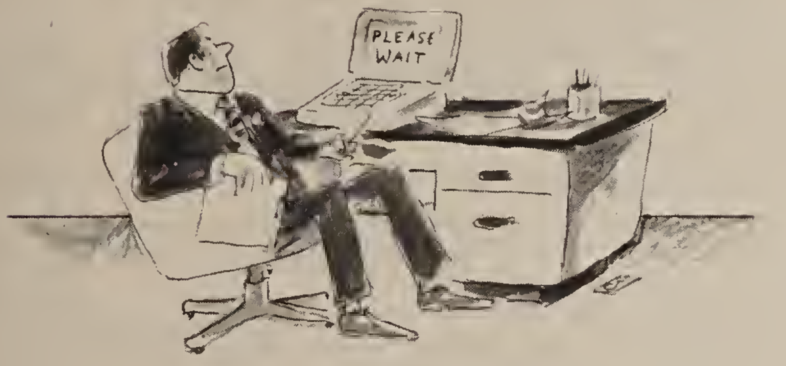
DO YOU SPEND MORE TIME WAITING ON-LINE THAN YOU DO WORKING ON-LINE?



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AT&T's next 3B anticipated

Mid-'87 delivery seen for expandable units

By Jean S. Bozman

AT&T is planning to release a new line of 3B-compatible multitasking computers that can be expanded after installation to meet users' growing demands.

Based on the existing 3B15 architecture, the anticipated family of Unix computers is optimized for transaction processing and should be announced early in the year, sources close to the company say. The computers will be priced in the $100,000 to $200,000 range and can be stacked on top of each other to create larger systems through field upgrades.

The system is designed on a multiple-CPU basis to distribute the work load, with each CPU based on a 32-bit chip. It is not clear whether that chip will be an AT&T WE 32100 chip.

AT&T spokesmen would not comment on the systems. "We do not discuss unannounced products," one spokesman says.

But observers say it is clear that the plan to market the transaction-oriented systems has been in the works for at least two years. The plans to develop it may even reach back to AT&T's initial 3B strategy, industry analysts and customers who have been briefed by AT&T say.

"This system has been ready for more than six months," says David Taylor, program director of Office Information Systems for the Gartner Group, Inc. in Stamford, Conn. "It's AT&T's way to prove to people that they're still very much interested in the computer side of their business."

It will also be a way to improve on existing 3B technology. By directing the work load to multiple microprocessor chips, system performance will fall off as more users log on. That often happens to 3Bs in office-automation applications, says Neal Nelson, president of Nelson and Associates, a Chicago Unix consulting firm that benchmarks Unix machines.

The computer's modular design will provide superior performance for AT&T's Unix System V operating system, says the Gartner Group's Taylor. That is because Unix is oriented to serving small work groups and has fallen short in certain CPU-intensive commercial applications.

Another facet, he adds, is that the system was designed to meet on-line transaction processing specifications, widening AT&T's market in commercial and banking applications. It is also said to provide fault tolerance via redundant components, possibly aimed at competing with Tandem Computers, Inc.

Some users are anticipating the new computer, expecting it will be announced in the first quarter and shipped in the second quarter of 1987.

"It's their way of saying, 'Hey, look, we're modern,' " says one federal user who was briefed on future products by AT&T. But many simply do not know about it, particularly users of smaller 3B2 systems. Apparently, much of the sales force has yet to be briefed on the product, but that may be because they are awaiting documentation, Taylor says.

The system may improve AT&T's image as a supplier of computer systems. Part of the image was AT&T's fault, analysts say. For example, it was AT&T's choice not to place the state-of-the-art 18-MHz WE 32100 chip in the existing 3B line, although the chip was made at AT&T's Bell Laboratories.

Until now, 3Bs have been using a 10-MHz and 14-MHz chip as a standard component, while AT&T customer Zilog, Inc. used the 18-MHz version in Zilog computers.

Another upgrade alternative for 3B users surfaced last week, with the announcement of a next-generation 32-bit chip (see story page 29). The WE 32200, scheduled for volume shipments in the second half of 1987, is designed to perform up to twice as fast as the 32100 chip. It is being tested by AT&T and its customers, says Al Hoffman, AT&T Technology Systems manager of microprocessor marketing.

What is uncertain is just when — and how — AT&T will see fit to announce the modular 3B successor. It might even carry a new name, to differentiate it from previous 3B products, Taylor suggests. Those familiar with AT&T marketing practices believe that the introduction could be put on hold, or even be changed slightly, as AT&T executives tinker with their computer strategy.

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Macs, printer due in January

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read-only memory (ROM), which includes part of the operating system, as opposed to the 128K-byte ROM systems in the current models. The systems run at 16 MHz and have a socket available for the Motorola 68881 math coprocessor, according to several independent developers who have seen the machines. Both, like models already on the market, have 1M byte of on-board random-access memory, expandable to 4M bytes.

One model has the same chassis as the current Macintosh, with an internal hard-disk drive and a single expansion slot to provide connection to third-party products, such as monitors or communications links, according to sources.

The second, open Mac is larger than the familiar Macintosh box, with five expansion slots. One slot is for a video connection, providing a color option. The user can also plug in coprocessor cards, and one developer speculated that the Macintosh could run Microsoft Corp.'s MS-DOS operating system or the Unix operating system with such a card. Apple announced almost a year ago that future versions of the Macintosh would run both of those operating systems.

Another developer was impressed with a prototype 12-in. monitor with four times the resolution of the existing Macintosh monitor that is also expected to be announced next month.

"When I looked at it, I thought I was looking at a photograph," he said.

Apple will also unveil a low-end laser printer, priced at approximately $2,000, sources said. Unlike the other Laserwriter printers, the new printer will not run Adobe Systems, Inc.'s Postscript page description language, but will use the Macintosh Tool Box and a version of Apple's Quick Draw routines to transmit graphics images.

However, Apple is testing an implementation of Postscript on the dot-matrix Imagewriter printer, one developer said.

The latest Macintosh units will probably not be available in quantity until March, according to sources within Apple. The new printer and a high-end Laserwriter still under development will ship even later.

Also in the works for release later in the year is a Macintosh designed with reduced instruction set computer architecture, according to sources.

The high-end Laserwriter, which will probably not be shown in January, will produce 1,000 dot/in. resolution, according to developers who have seen the printer.

Apple is being very cagey about its January announcements, and observers say it is because some marketing decisions are still being made. In fact, Apple engineers built several versions of next-generation Macintoshes, some for strictly internal development use and others for evaluation and evolution into commercial products.

"Every product has about nine code names," said one Apple employee. "At every staff meeting, we have to list the code names on the board so we know we're all talking about the same thing."

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New company freed from distractions of Honeywell goals

Compatibility not an issue in venture

By James Connolly

The logic may have been as simple as a desire to let designers build computers without concern for the impact on the thermostat business when Honeywell, Inc. agreed last week to sell its computer operation.

One apparent goal of the pact, under which Honeywell Information Systems will be bought by a consortium of Compagnie des Machines Bull, NEC Corp. and Honeywell, is to separate the computer business from Honeywell's other business groups, which sell products such as building and industrial controls and military equipment. The move should let the new firm focus on computers while continuing to eliminate redundancies the long-time partners have in their products and lets Honeywell focus on its controls and defense businesses.

The consensus among Honeywell officials, analysts and users is that users will not see dramatic near-term changes in the Honeywell Information Systems product line, at least no changes of a scale where entire processor lines are dropped and factories are closed.

Stan Lauck, president of the 500-member Honeywell Large Systems Users Association (HLSUA), noted that NEC, Honeywell and Bull have worked toward common architectures for several years. He is one observer who feels the new company will focus more resources on computers than Honeywell itself could.

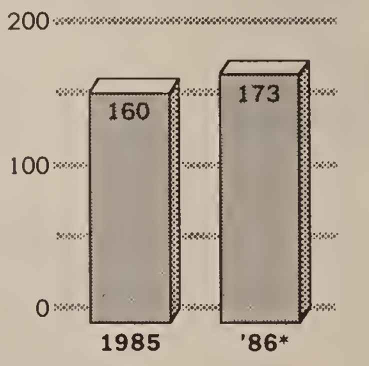
"From our perspective it's positive. We felt that Honeywell, with its diverse businesses, was not able to focus its efforts on the computer business as much as we would have liked,'' said Lauck, who warned that the transition to the new company could lead to confusion for customers in the next year.

But Lauck also noted that bringing Honeywell, Bull and NEC closer together could speed technical developments, particularly in the peripherals and the general business software areas.

The venture received preliminary approval from one of Honeywell's largest users, General Electric Co., which sold Honeywell its own computer business in 1970.

"Honeywell has kept us informed all along regarding what was going on. We've had a long-running relationship with them, and the relationship between the two companies is good. So, we knew what they were doing. We don't have any problem with it,'' said Edward Skiko, GE vice-president for corporate information systems.

Honeywell large systems shipments



* Projected DPS8, DPS7, DPS88 and DPS90 shipments

Information provided by International Data Corp.

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However, he is reserving judgment on whether the venture will succeed in the long term. "Whether it will be a big boon to them or a boon to us, it's too soon to tell. There is a long way to go before we see how well they implement it,'' Skiko said.

Jerome J. Meyer, Honeywell executive vice-president for U.S. information systems and the man expected to be top executive of the new firm, said no particular product shifts are planned. He also promised, "We in the U.S. will continue to produce and design the product lines that are in place.''

He said the current and continuing Honeywell product lines include the DPS 90 high-end mainframe made by NEC, the DPS 88 mainframe made by Honeywell in Phoenix, the DPS 7 small mainframe made by Bull, the DPS 4 mid-range system made by Honeywell, the DPS 6 and DPS 6 Plus minicomputers made by Honeywell in Massachusetts and the XPS 100 Unix-based minicomputers made by Honeywell Information Systems Italia in Italy.

Meyer said there is no need to eliminate product lines because of overlaps among the partners since partnerships dating back as long as 24 years have tended to eliminate competition among the three.

One analyst offered mixed views. "They can make a better go of it than Honeywell has been proving they can do themselves, although I think it would be even better if NEC had more of a role in the new company,'' said analyst Donald Bellomy of International Data Corp., a Framingham, Mass., market research firm.

But Bellomy said users should not notice major changes for several years, at least until Honeywell managers move out of the new company or Honeywell sells the rest of its stake in the firm.

When asked whether he expects Honeywell customers to jump to IBM or other vendors because of the sale of Honeywell Information Systems, analyst Michael Geran of E. F. Hutton & Co. in New York responded, "The answer to that question lies with how successful the new company is in explaining to the customers how it is going to function, what are the benefits of the merger, what it means to the uninhibited flow of products.''

He noted that Burroughs Corp. Chairman W. Michael Blumenthal "did a superb job of quieting down'' Sperry Corp. customers when Burroughs acquired Sperry to form Unisys Corp.

Foreign control endorsed by some

From page 1

veyed had plans under way to migrate from Honeywell systems to IBM or IBM-compatible vendors. Among the reasons for the changeovers were lack of application software and inadequate field service.

"Unless they start putting some more money into their customer response areas, they could merge with anybody they want, and it's not going to make any difference,'' said John Timmer, senior equipment analyst at the U.S. Department of Transportation Computer Center in Washington, D.C.

Timmer, whose facility will be standardizing on an Amdahl Corp. 5080 because of a reorganization, criticized Honeywell's field service, claiming that the vendor "just doesn't have enough employees to respond to problems.''

"I think it's probably a good move for Honeywell because they've got a big problem in the mainframe area,'' Timmer said. "No matter what you do, IBM's going to rule the world. It's still very, very difficult to compete with IBM. You never hear any complaints about IBM service.''

However, the majority of surveyed customers said they expect the merger to only improve Honeywell's performance, especially with Bull's input. In fact, most of the users said they were planning upgrades or acquisitions and would remain Honeywell customers.

"We are in the process of reviewing the DPS 6 Plus,'' said Michael Finley, director of MIS at Six Flags Corp. "It's a pretty sure 'maybe' that we will buy it. My only concern is that the agreement won't be final till the end of March. If the agreement falls apart, would Honeywell sell to whatever vendor comes along? I'll be more comfortable when this is put to bed.''

However, Finley added, "I'm pleased with the whole deal, and I think we will come away with a far better firm. This company existed anyway between Honeywell, Bull and NEC, since they had similar products. Now it is just official.''

That thought was echoed by other users. Honeywell, Bull and NEC are already standardized and compatible with each other. Versions of the GCOS operating system have some differences, but are basically compatible, and the firms are already linked in a number of places from the high end down to the low end, according to many MIS managers.

Bull and NEC received high marks from those customers who have done business with them previously. "Just knowing about some of their products and having worked with some of their people, I have a high regard for them,'' said 10-year Honeywell customer Gary Zmijski, DP manager at Budd Co. Plastics Division.

Bull has a commitment to customer support, says Vito Battaglia, manager of information services at Borg-Warner Automotive, Inc. in Bellwood, Ill. Battaglia witnessed how Bull works in Borg-Warner's Brazil plant, which has a DPS 7.

One Phoenix-based customer, who owns a NEC-manufactured DPS 90 mainframe, said that even though the machine arrived on a 747 jet from Japan last June, the few minor problems he had during installation were handled immediately in the U.S. by Honeywell. "It's almost business as usual,'' said Eugene Lheureux, director of data operations at Blue Cross/Blue Shield.

Many customers said they now hoped that Bull, projected holder of the controlling interest in the new entity, will be able to market some of its DPS products, previously available only in Europe, in the U.S.

"We have a Honeywell/Bull DPS 7, manufactured in Europe. This merger will mean a better support scheme because in Europe, it is a much more powerful machine. If Bull gets firmer here, service and support will improve, although we are already very happy with our support,'' said the MIS manager in a $200 million, 6,000-employee, worldwide transportation firm that requested anonymity.

AT A GLANCE

Compagnie des Machines Bull

Headquarters
Paris

1985 Revenue*
$1.8 billion

1985 Profits*
$12 million

Employees
26,400

U.S. Subsidiaries
Bull Corporation of America, Waltham, Mass.
- Microcad Technologies, Inc., Dallas
- Bull Peripherals Corp., Sunnyvale, Calif.
- Bull Micral of America, Minneapolis

Sample of U.S.-based customers served worldwide
American Express Co., CBS, Citicorp, Exxon Corp., Ford Motor Co., General Electric Co., Mobil Corp.

* Based on average 1985 exchange rate

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The DPS lines are stronger in Europe, concurred Demoulas's Kelley. The DPS 7 in Europe, for instance, supports color terminals — not true in the U.S. — and has greater compatibility with other vendors' tools.

Contributing to the customers' positive feelings was the fact that Honeywell apprised them of the coming merger either through the national users group, a special Honeywell council for major users, or through personal phone calls and letters.

"Sometimes, these computer company mergers remind me of this Iran deal with the president,'' said Six Flags Corp.'s Michael Finley, "but Honeywell has been very quick and very up-front about it.''

"We've been assured there would be no fundamental change in how things were going to be done,'' added Ricardo Valdes, director of DP services for the city of Worcester, Mass. The city has a Honeywell DPS 8 dual-processor mainframe and two DPS 6 minis, and the vendor has promised it will continue with the same line.

"My only concern is with responsiveness,'' Valdes said. "If I have a problem now, I talk to the big folks. That might be different if the real decisions are made on the other side of the Atlantic.''

CW's Washington, D.C., correspondent Mitch Betts contributed to this report.

Bull calls shots in bargain deal

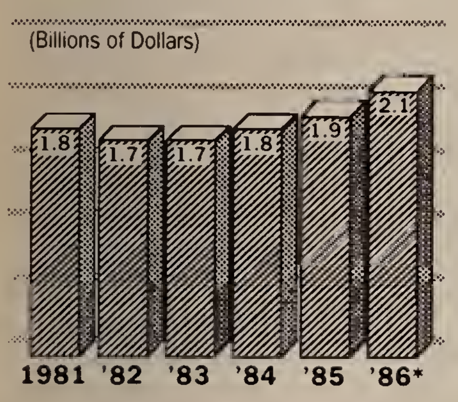
From page 1

15% of the venture. Operations will be run by Honeywell's current Information Systems management team under U.S. Executive Vice-President Jerome J. Meyer, but the management will report to a board with a majority of seats held by Bull.

In addition, Honeywell has the option to reduce its share to less than 20% of the venture by the end of 1988, a further retreat that most analysts considered likely. "Honeywell is a controls and defense company now," Milunovich said. "It sees a much better chance of growth there."

The announcement concluded a tumultuous year of restructuring for Honeywell, which has reorganized both its controls and information businesses and reduced its work force by some 4,000 employees.

The Information Systems unit, hurt by a sluggish market at the high end and increasing competition in the mid-range, has been considered a drain on the company's more profitable business. Information Systems profits will tumble from $200.1 million in 1985 to between $90 million and $100 million this year, analysts have estimated. The unit recorded revenue of $1.95 billion in 1985.



Honeywell Information Systems Group
Financial performance, revenue

* 1986 projections provided by Dain Bosworth, Inc.
1981-'85 figures rounded off from Honeywell reports

MITCHELL J. HAYES

Honeywell will retain the federal systems portion of its computer business, primarily because federal procurement bids require U.S. ownership of vendors. Control Data Corp., in fact, is challenging a recent Honeywell government contract on the grounds that the CPUs it will sell to the government are made by NEC [CW, Oct. 27].

"We believe that the new venture is an American company run by American management, but the laws of the land look at controlling equity interest and don't give you any leeway," Meyer said.

Meyer characterized the joint venture as an evolutionary step in the relationship between Honeywell and the two foreign vendors, which date back to 1970 for Bull and 1962 for NEC. In 1984, Honeywell began selling NEC mainframes under the Honeywell label.

"At that time, we took a good hard look at the future of our business and decided we had to off-load some of our R&D expenses if we were to continue to supply mainframes," Meyer said. "I don't think we have changed our view very much now; this is simply the next step to implement that strategy. There should be no question now about our long-term viability."

Meyer said Honeywell is committed to maintaining its U.S. manufacturing facilities, based mainly in Phoenix and the Boston area, despite some production overlaps within the new company. "We will still make the DPS 6, for example, in Boston, the U.K. and France. The French market wants a French product, and the U.K. wants a British-made product," he said.

Meyer said no major layoffs are planned, but acknowledged, "We may have some overlaps and some people in the wrong place."

> ***"We believe that it is an American company run by American management."***
>
> — Jerome J. Meyer
> Honeywell Information Systems

The new company will open a huge U.S. distribution network to Bull and NEC, but there is no guarantee that it will be successfully exploited, analysts said.

"Bull is making the bold move, and it is a risky one in my view," said Gary Blauer of Dain Bosworth, Inc. in Minneapolis. "How many wildly successful foreign computer companies are there in the U.S.? It's a hard business from here and even harder to manage from overseas. Honeywell will have less than a 20% interest in the company by 1988, so it won't matter as much to them."

NEC's equity participation in the venture was smaller than expected, but the Japanese firm may have influence disproportionate to its investment. "NEC felt it was in the driver's seat," said Michael Geran of E. F. Hutton & Co. "It had the technology, so it felt it only had to purchase a minority interest. It accomplished its objective without putting up a lot of money."

NEC President Tadahiro Sekimoto brushed aside speculation that NEC will be joining forces with Honeywell merely to help revitalize the Minneapolis-based company's bearish computer business. Said Sekimoto, "We'll not be a rescuer or a supporter, but just an equal partner."

Asian bureau chief Takehisa Kondoh contributed to this story.

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Ethernet to connect with 370s

By Donna Raimondi

Intel Corp.'s Systems Interconnect Operation (SIO) will announce this week an enhancement to its Fastpath family of connectivity devices that allows all IBM 370 architecture machines to communicate with other IBM systems over an Ethernet local-area network.

The $5,500 enhancement to the $32,000 Fastpath system provides a high-speed direct channel interface to bring all IBM 4300, 3030, 3080, 3090 and compatible mainframes onto an Ethernet and allows any Ethernet software that runs on an IBM 9370 to run on the 370-class systems. The addition of Intel's Flexlink software allows IBM and Digital Equipment Corp. VAX systems to share resources and files on a network. Flexlink provides a link between IBM's Systems Network Architecture networks and DEC's Decnet, performing required format conversion between ASCII and EBCDIC and enabling a DEC or ASCII terminal to access an IBM 370 system and an IBM terminal to access a DEC VAX.

Large IBM shops that need a channel-attached capability are typically connecting to IBM peripherals, so there is not much point in the product for them, according to analyst Kim Myhre of International Data Corp. The value of the system is for production IBM shops with DEC minicomputer systems that want to send files at channel-attached speeds between the two architectures, he said. Such users were probably running some sort of IBM emulation program on the VAX, using Synchronous Data Link Control dial-up lines or direct cable connections into an IBM system before, he said. "Doing that is workable, but it is slow," Myhre said.

Fastpath was designed to the channel specification for the integrated Ethernet controller available in IBM's 9370 computers. The Fastpath 9750 connectivity controller consists of a control unit with a channel connector (an interface to IBM's standard 370 block multiplexer channel) and firmware emulation of the 9370 integrated Ethernet control unit. The mainframe user does not need a 9370 in order to connect Fastpath; each mainframe is connected directly into the Fastpath box, a spokesman said.

The product does not necessarily do something that could not be done before; it just does it faster, according to Myhre. "In light of that, it's a cost/performance trade-off. If you need the bandwidth . . . then it would be useful, but you would have to match that against the proposed costs for the system," he added.

"With one terminal on the desk, a CICS user can go through Fastpath and look like a VMS user to the DEC system, and the DEC user can go through and look like an IBM user to the IBM system," said Roger Thomas, SIO's general manager.

HP workstation squares off against recent Sun product

By Rosemary Hamilton

PALO ALTO, Calif. — Hewlett-Packard Co. is scheduled to announce today a high-end model to its engineering workstation line designed to directly compete with Sun Microsystems, Inc. systems.

The HP 9000 Series 300 Model 350, which will be offered in six configurations starting at $21,900, is based on the Motorola, Inc. 68020 microprocessor with a 25-MHz clock speed. In August, Sun Microsystems introduced high-end models based on the recently introduced 25-MHz 68020.

A Sun Microsystems spokeswoman declined to comment on the HP models until Sun has the opportunity to see the systems.

Mid-range slot

The Model 350, available Jan. 1, pushes the Model 320 line, HP's current 68020-based engineering system, to a mid-range slot in HP's workstation lineup. The Model 320, with a 16-MHz microprocessor, starts at $8,000 and will now be targeted at more price-conscious customers, according to the vendor.

"The 350 will pretty seriously impact the 320, but we don't expect the 320 to be eliminated," said James Fentress, a marketing manager.

In addition to the 68020, the Model 350 comes with a Motorola 68881 floating-point coprocessor, 8M bytes of main memory, which is expandable to 32M bytes, and the HP-UX operating system.

Disk drives are not included with the system, but users can add disk storage in various configurations, starting at 10M bytes.

The Model 320 can be expanded to accommodate 16 571M-byte disk drives, HP said.

One 571M-byte disk drive costs $17,600, while a 10M-byte disk drive costs $2,000.

The Model 350SRX, the high-end of the 350s, also includes an HP-designed graphics coprocessor for three-dimensional solids modeling and a 1,280- by 1,024-pixel high-resolution color display. The diskless price is $54,900.

Other configurations include two systems, designed for artificial intelligence development work, which start at $28,400.

Others include a $24,600 monochrome system and a color version for two- and three-dimensional wireframe modeling that starts at $32,900.

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12 cyl. PDS Copy				
Iebcopy	9 min. 14 sec.	1 min. 20 sec.	10,792	$18.47
PDSFAST	48 sec.	.7 sec.	122	$1.75
47 cyl. PDS Unload to Tape				
Iebcopy	58 min.	14 min. 52 sec.	97,253	$92.05
PDSFAST	4 min. 3 sec.	37 sec.	911	$5.74
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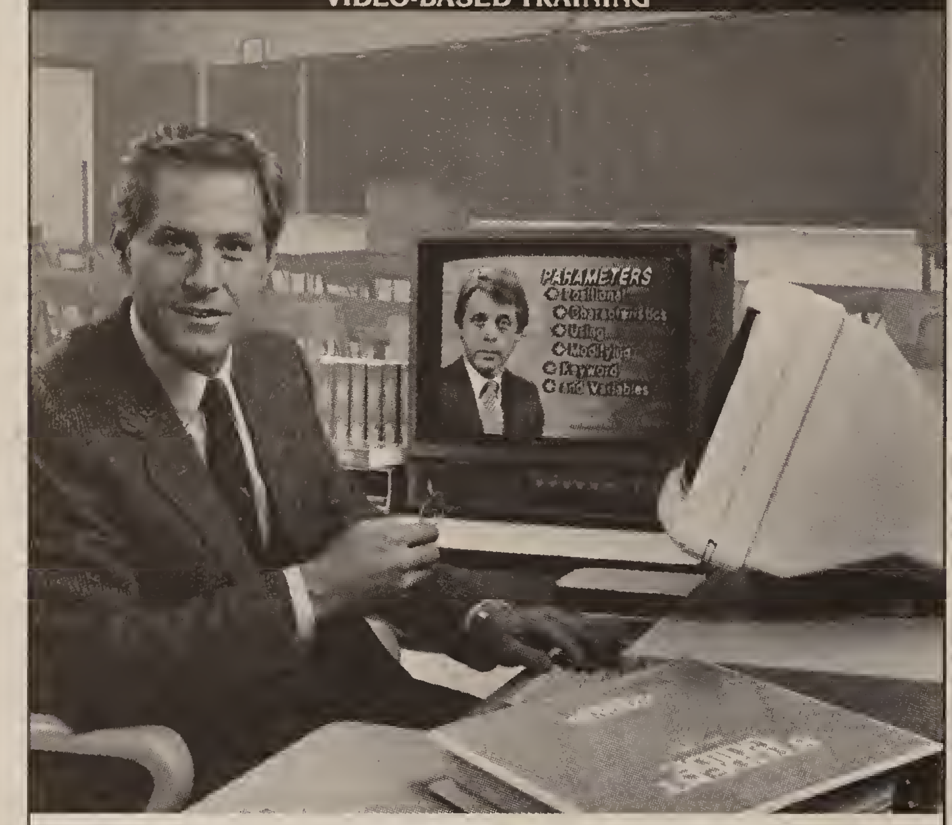

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Vendors gear up to provide document interchange options

By Elisabeth Horwitt

Projected Electronic Data Interchange (EDI) offerings from three major vendors promise greater options for companies that want to exchange documents with suppliers, customers and business partners.

Later this week, General Electric Information Services Co. (GEISCO) and mainframe software vendor Management Science America, Inc. (MSA) are expected to announce a business partnership that is designed to provide users with one-source EDI solutions.

Last week, Western Union Telegraph Co. announced its intention to enter the EDI arena in 1987. The company is already committed to providing EDI networking and document distribution in the near term, with the strong probability of eventually providing protocol conversion services , said Roy Anderson, vice-president of Telex and Easylink marketing.

Western Union is also currently seeking a joint-venture partner that would provide EDI conversion software on customer premises, Anderson said. "How much we provide on our side depends on how much demand there is for conversion and validation services," he added. Validation ensures that a document got to its destination in the right format.

> ***'The more integrated and less stand-alone EDI is, the more reason customers have to buy it.'***
>
> — Victor Wheatman
> Input

Western Union will also leverage its installed base of Telex and electronic mail users, Anderson noted. "A lot of Telex users can be expected to migrate to EDI, and, unlike Telex, EDI is not vulnerable to incursion" from the facsimile sector, he said.

The company is likely to target the grocery sector initially, since it traditionally has a lot of customers in that sector, Anderson said.

Western Union also announced that the ability to handle binary code would be added to its packet-switched network by mid-January, and to Easylink electronic mail service by the second quarter of 1987. This feature enables a communications service to transmit an application with embedded executable code, such as a spreadsheet or editable document.

Last week, Western Union's competitor MCI announced this capability for its own electronic mail service, MCI Mail, in conjunction with Lotus Development Corp. (see related story on page 14).

The GEISCO-MSA partnership will integrate GEISCO's document distribution services with MSA's mainframe software packages. The Expert EDI software package recently announced by MSA takes documents generated by an MSA business application and translates them into whatever format is being used by the business that will receive them, noted Patrick Tinley, vice-president and general manager of MSA's logistic systems division. GEISCO's networking services take care of routing and distribution of documents as well as ensuring that they arrive at the correct destination in the right format.

As there is still no universal EDI standard among different industries, EDI Expert is a potential solution, said Art Hughes, client representative for Arco Oil & Gas Co. revenue systems projects. Hughes added, however, "I'm suspicious of anyone who claims to be able to convert anything to anything, especially when you consider how much formats keep changing." Arco is part of a group of 14 major petroleum companies that use GEISCO's EDI services to exchange information among their revenue operations.

According to GEISCO EDI software programs manager John Barber, the two companies are also developing a software interface between Expert EDI and GEISCO's EDI networking services.

The proposed MSA partnership is one of a series of similar ventures that GEISCO has finalized or currently is contemplating. Earlier this year the network service company announced agreements with American Business Computer and Apparel Computer Services, Inc., both industry-specific EDI software companies.

"MSA does not have as narrow a vertical market, but they do have a broad customer base among manufacturing and distributing industries, which is one of our focuses," Barber said.

MSA will interface Expert EDI with other vendors' EDI systems, if the customer wishes, Tinley noted. "We are providing a universal interface to all value-added network vendors, not just GEISCO."

GEISCO already offers generic translation services to convert customers' documents to popular ANSI X.12 and AIAG formats on the vendors' own systems, Barber said. "We also will provide customized translation services, but that is so expensive most customers prefer to do it in-house."

If the partnership goes through, a joint GEISCO-MSA offering is scheduled for availability by mid-1987, Barber claimed.

The fruits of the GEISCO-MSA alliance could add significant viability to the EDI market, said Victor Wheatman, a senior consultant with the Mountain View, Calif., market research firm Input. "The more integrated and less stand-alone EDI is, the more reason customers have to buy it," he noted.

Input's 1986 EDI report predicted EDI revenue for 1986 would more than double the firm's 1985 estimate of $24 million.

Network service companies Telenet Communications Corp. and Computer Science Corp. are also expected to take the EDI plunge in 1987, computer industry sources claimed.

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V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue **and** accounts over $10,000." But only ORACLE can optimize "Select accounts 90-days overdue **or** accounts over $10,000."

☐ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with **logical** sets of data. But they manipulated only one **physical** record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

☐ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multiprocessing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

☐ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

☐ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

☐ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.

Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the first time, high transaction thruput is achieved by a fully relational DBMS.

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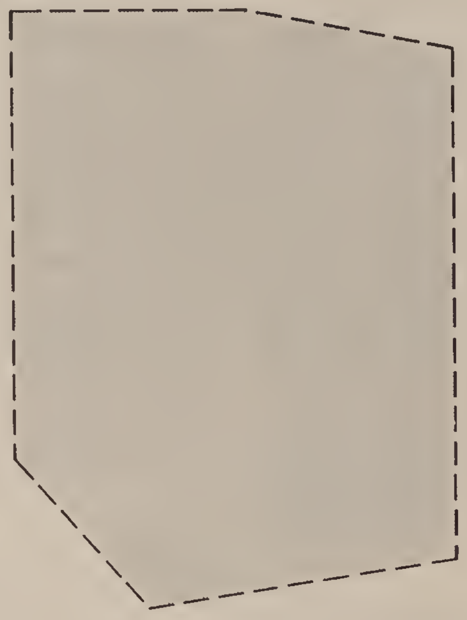

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Growth of EDI applications expected to spur E-mail use

By Mitch Betts

WASHINGTON, D.C. — Users and vendors at last week's Electronic Mail Association conference agreed that electronic mail is not just for sending memos anymore.

Electronic mail is increasingly outgrowing its popular name and adding a variety of electronic data interchange (EDI) applications that include the transmission of purchase orders, invoices, forms and spreadsheets.

Thomas J. Miller, manager of the private electronic mail system at Westinghouse Electric Corp. in Pittsburgh, suggested that future growth of his system will be fueled by EDI applications such as purchase orders and requisitions for equipment. He said his system, which uses software from Dialcom, Inc. in Silver Spring, Md., has about 10,000 users, including about 500 customers and suppliers.

Creating purchase orders

"Some users have already adapted our electronic mail system to create and transmit purchase orders," Miller said. "We've got to do a lot more of that and do it better."

Miller's comments at the conference "Electronic Messaging '86" came the same day that Lotus Express for MCI Mail, a micro software product that can transmit binary files such as spreadsheets and order forms, was introduced by Lotus Development Corp. and MCI Communications Corp. (see story page 14).

"Basically, electronic mail becomes file transfer," said Stuart P. Davidson, marketing manager for MCI Mail in Washington, D.C.

Similarly, Telenet Communications Corp. in Reston, Va., announced the availability of PC Telemail, an electronic mail package for IBM-compatible micros that permits transmission of spreadsheets, software files, graphics, electronic forms and documents, which can be edited and revised upon receipt. PC Telemail costs $150 per copy and requires 256K bytes of random-access memory.

Western Union plans

Western Union Telegraph Co., the Upper Saddle River, N.J.-based vendor of the Easy Link electronic mail service, also plans enhancements that will incorporate EDI services into Easy Link (see story page 10).

John Sidgmore, vice-president of General Electric Information Systems Co. in Rockville, Md., commented that only those vendors that offer user-demanded applications will make money in the electronic messaging business.

Growth in the industry, he said, will be based on intercompany and interindustry applications. "Because electronic mail is an interactive service, we can count on the increased volume of electronic mail activity between companies and industries to expand the market for us," Sidgmore said.

United schedules 9370s for Xmas

From page 1

Another product will be the 9370-based Enterprise travel agency system.

In the Enterprise travel agency sytem, PCs will be connected to the Enterprise host by "off-the-shelf methods, including the IBM Token-Ring network, the IBM Workstation Adapter and remote communications by modems."

As yet, none of the 9370s are installed, Feinberg said, but eight IBM 370 computers that are also part of the system have been operating. Software development was carried out on an IBM 4300 series machine. The software will run on any 370 processor, from the smallest to the largest, including the 9370. The IBM Federal Systems Division is under contract to Apollo Services to design the software for the Enterprise system, Feinberg said.

Although the two systems are separate, Enterprise will draw on Apollo as a data base from which it will obtain flight information. Enterprise will then combine that information with customer information provided by the travel agents.

Rudolf Strobl, an analyst with Arthur D. Little, Inc. in Cambridge, Mass., said the Federal Systems Division, together with United, has developed a powerful peer-to-peer communications facility, superior to the VM-to-VM facility announced with the 9370, called Transparent Services Access Facility (TSAF).

Strobl said the system is efficient in handling a large volume of on-line transactions per second. The system can perform synchronous and asynchronous distributed transaction processing for such tasks as preseat selection from a terminal on the network that can be located anywhere in the U.S.

He speculated that Apollo Services might seek to sell this product in addition to its other offerings when it becomes a subsidiary. He also suggested that other users could try to imitate the communications facility, which uses neither TSAF nor VTAM. "Others will need what United has," Strobl said.

Although IBM's Federal Systems is assisting United in developing the program, United would own any product developed for the Enterprise system, according to a spokesman for IBM's Federal Systems Division.

> ”
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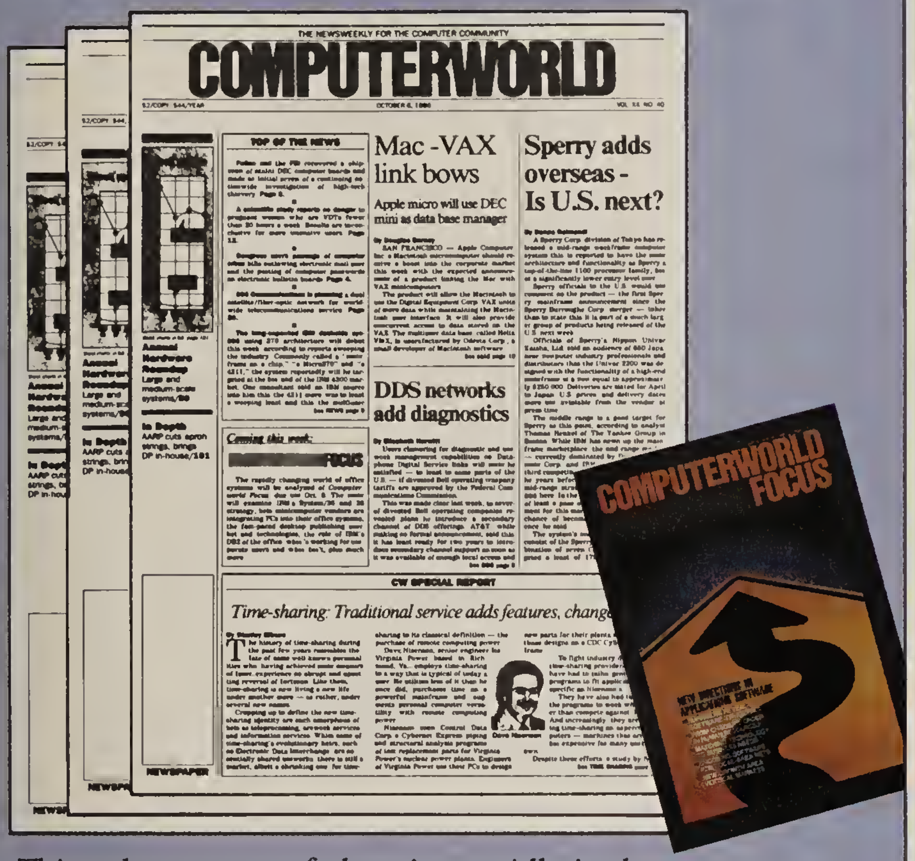
> ***The early deliveries diminish criticism that the 9370 systems would be too far down the road to make a major impact on DEC's success.***

WEEKLY.



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OCTOBER 6, 1986

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3317-8649

Cullinet wins latest round in G/L Plus fight

By Eddy Goldberg

BOSTON — Cullinet Software, Inc. last week won a reversal of an earlier judgment in its nearly 2½ year court battle with McCormack & Dodge Corp. over where Cullinet is permitted to sell its version of M&D's G/L Plus general ledger software.

The disagreement centers around Cullinet's right to market its version of G/L Plus, named General Ledger, beyond the U.S. and Canada.

While M&D claims Cullinet cannot do so, Cullinet claims the original agreement allows it to market the product overseas five years after the original agreement was signed Aug. 25, 1981.

The court case began July 3, 1984, when Cullinet sued for a declaratory judgment in Massachusetts Superior Court, seeking an interpretation of a particular clause in the agreement, claiming that clause would give it the right to market the product worldwide after five years.

> ***The case is essentially back to square one. With M&D's initial victory reversed, Cullinet is back on even footing.***

However, the first ruling went against Cullinet. The Superior Court ruled the language in the agreement was clear and Cullinet could not sell General Ledger overseas.

M&D countersued for damages, claiming Cullinet's representations to overseas customers and prospects that it could sell its General Ledger overseas after Aug. 25, 1986, were harmful to M&D's sales opportunities abroad. M&D won that round, though judgment for damages has yet to be made. Cullinet appealed. The appeal, which lasted just more than one year in the Appeals Court for the Commonwealth of Massachusetts, was successful.

On Dec. 3, the Appeals Court reversed the judgment of the Superior Court, ruling the language in the agreement — specifically in a clause regarding the five-year lifting of certain restrictions — was ambiguous.

The case, sent back to the Superior Court for a new trial, is essentially back to square one. With M&D's initial victory reversed, Cullinet is back on even footing. Spokesmen for both sides expressed confidence they will prevail.

A Cullinet spokesman said the company has not yet actually sold the G/L Plus derivative overseas, nor does it intend to until the case is finally decided. That may take years, as an appeal is still possible after the next ruling. Spokesmen from both companies said no new trial date has been set.

HP adds to office information system family

By Jeffry Beeler

ROSEVILLE, Calif. — Hewlett-Packard Co. last week enhanced its office information system, the Personal Productivity Center, with the announcement of two software products that reportedly simplify the central storage, distribution and management of business documents.

For MIS executives, HP's Resource Sharing and Information Access packages purportedly offer at least two major benefits: improved data security through an automatic file backup feature and relief from the task of having to help end users formulate their ad hoc data base queries.

For end users, meanwhile, the two additional software products reportedly raise the level of HP's networked printer capabilities and speed the downloading of departmental data into spreadsheets and other popular personal computer applications.

Resource Sharing, according to HP, allows PC users in a local-area network (LAN) to share an HP 3000 disk system and makes it logically indistinguishable from the storage modules in their own workstations.

HP's office systems have previously enabled documents to be stored centrally in an HP 3000 disk and to be subsequently downloaded to PCs. But to gain access to the information, users have traditionally had to invoke programs to convert HP formats to their Microsoft Corp. MS-DOS counterparts.

Automatic format conversions

With Resource Sharing, in contrast, an integrated utility performs the necessary format conversions automatically, according to Tom Black, marketing manager for HP's Office Systems Division (OSD).

The result is a transparent disk-sharing capability that yields several potential advantages, some of which are graphically illustrated at one of the HP software product's beta-test sites.

"With Resource Sharing, we can create documents and store them centrally in our 3000 Model 48," according to Robert Tivey, computer services director at the Wall Street law firm of Cadwalader, Wickersham and Taft.

"If we later want to distribute the same document to 10 people in the company, all we have to do is to send each a one-line message identifying the item and informing them of where it is located. They can then download the document from the Model 48 disk as if the information resided locally in our HP 150s," he said. "In a nutshell," Tivey added, "we're now able to treat our HP minicomputer like just another PC in our LAN."

> ***'In a nutshell, we're now able to treat our HP minicomputer like just another PC in our LAN.'***
>
> — Robert Tivey
> Cadwalader, Wickersham and Taft

Resource Sharing also incorporates two other software components. One automatically creates a tape backup copy of all documents that are stored centrally in an HP 3000 disk, according to Kyle Murphy, a product manager at the OSD.

The other software component is an enhancement to HP's existing Print Central product, which allows end users to share a networked printer. Unlike the original Print Central, which supports text-only devices exclusively, the improved version extends the printer-sharing concept to HP's Laserjet and thus enables users to include graphics in their documents, Murphy said.

Of Resource Sharing's three main parts, the automatic tape backup facility "is the most significant because it reassures users that they won't lose their files," according to Alexia Martin, associate editor with the Seybold Office Computing Group.

Complementing Resource Sharing is its companion product Information Access, an enhanced version of HP Access, an existing product that reformats the contents of HP 3000 data bases and sends the information to standard PC programs.

Personal report writer

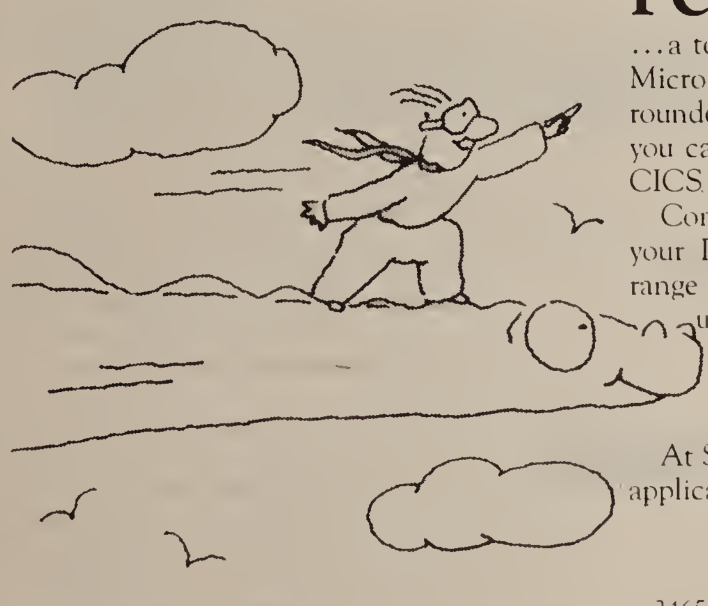
Unlike its predecessor, Information Access sports a personal report writer that reportedly allows users to customize their forms and run ad hoc data base queries without necessitating MIS intervention. "What we've done with the product is to shift the burden of constructing reports from MIS managers to PC end users," Murphy said.

But although its built-in report writer greatly eases document retrieval, Information Access purportedly retains the existing package's ability to allow systems executives to control data base usage and thus maintain security.

After selected files are pulled from an HP data base, they can be loaded via Information Access into PC programs such as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase II and Microrim, Inc.'s R:Base 5000. An identical downloading capability existed previously with HP Access.

But with its successor, the speed with which downloaded data can be joined and summarized in a PC has been increased by at least 40%, Black said.

Both Information Access and Resource Sharing are available immediately and, in a 10-PC configuration, have starting prices of $5,900 and $4,800, respectively.



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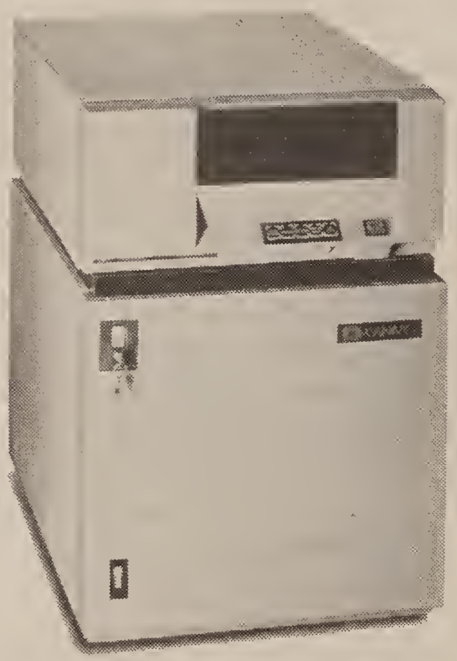

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NEWS

Software tool extended to VM

By Alan Alper

NEW YORK — Computer Associates International, Inc. last week extended CA-Unicenter, an IBM-compatible mainframe software product for the management of corporate data centers running the IBM MVS or VSE operating systems, to also operate under VM.

At a press conference here, Computer Associates Chairman Charles Wang said the Garden City, N.Y., software developer has added VM compatibility to CA-Unicenter in response to growing support of the operating system. He pointed to IBM's recently unveiled mid-range family of processors — the 9370s, which operate under both VM and VSE — as indicative of Big Blue's blessing on the operating system.

David Tory, Computer Associates' vice-president of planning, pointed out that use of the VM operating system is growing at a rate of 35% to 40% annually. Yet few IBM shops use VM exclusively, he added.

"About 2% to 3% of the IBM installed base is pure VM," he said.

In recognition of the concurrent use of VM with MVS and VSE operating systems, Computer Associates' latest version of CA-Unicenter integrates and controls the entire data center with software that runs under all three environments and facilitates the sharing of common commands, catalogs, data bases and other facilities, the firm said. Also provided are a variety of facilities developed exclusively for VM.

Like the original product, unveiled in June 1985, CA-Unicenter for VM consists of three components.

The first component consists of integrated software packages that perform job scheduling and accounting and file management functions. It includes a VM directory administrator and end-user tools such as CA-VTerm, a multiple-workstation facility.

The VM directory administrator, CA-Director, offers multinode support, allowing multiple CPUs to be controlled from a central location; profile, which is said to eliminate the need to continuously repeat information each time a directory entry is made; and prototype models, said to reduce the time and effort needed to create and modify user identifications when the product is used by different operators.

CA-VTerm allows users to operate up to 16 virtual terminals from one terminal and features predefined sets of operational commands and terminal programs executed automatically to permit automation of repetitive or procedural screen functions.

The other two components are CA-Activator, an interactive, on-line system said to automate and simplify software installation and maintenance, and CA-Uniservice, a service and support system that links users to Computer Associates' mainframe via a communications network, providing access to program fixes and diagnostic information at any hour of the day. These two components were introduced with the original CA-Unicenter.

The CA-Unicenter for VM is currently available for $63,000. It can be purchased as an integrated product or in component form, the firm said.

Lotus, MCI unwrap package for PC file transfer using MCI Mail

By David Bright

CAMBRIDGE, Mass. — Lotus Development Corp. and MCI Communications Corp. last week jointly introduced a software package that sends messages and binary files between IBM Personal Computers using MCI Mail.

Lotus Express for MCI Mail automates the sending and receiving process and can transfer files created by Lotus or non-Lotus programs, the companies said. The transferred files can reportedly be manipulated with any programs that use the same format as the programs creating the files.

With the package, the companies are targeting business PC users who need to exchange information quickly and efficiently. The companies claimed Lotus Express offers clear-cut advantages over overnight services and electronic mail packages.

Lotus Express should be used when information "absolutely, positively has to be there in a few minutes," quipped Lotus Chairman Jim Manzi.

The ability to transfer binary files is not unique in the industry, but Lotus Senior Vice-President Charles Digate said Lotus Express offers four key advantages over other electronic mail packages: the ability to perform full-screen editing; a menu-driven user interface; the ability to run concurrently with other applications; and its mail management capabilities.

The package can help speed communications between a corporation's headquarters and divisions and help corporations provide faster service to their customers, Digate said. He said prospective users include a range of business people, from lawyers to investment bankers to journalists.

"The major advantage of the Lotus Express package is that you can transfer files with a few simple keystrokes," said Fred Bartl, a consultant with Telecommunications Management Corp. in Needham Heights, Mass. This feature allows the transferral of any binary file, Bartl said, and will be particularly useful for interactively manipulating business application spreadsheet models.

According to Lotus and MCI, the cost of sending a 6K-byte spreadsheet with a cover letter from New York to San Francisco is $1. That cost, which includes connect time and transaction charges, is billed to the sender only. With other options, users can send laser-printed documents or telex messages.

Lotus Express will retail for $100 and includes a one-year subscription to MCI Mail.

IRS rules against tax breaks for home computer owners

Bringing work home won't pay off for many

By Mitch Betts

WASHINGTON, D.C. — Thousands of corporate employees may find that a recent Internal Revenue Service ruling makes it virtually impossible to take any business tax deductions for personal computers they have purchased in order to take work home from the office.

In essence, Revenue Ruling 86-129 said that employees can take business deductions for a home computer only if the company's computers are insufficient for the employee to do the job.

Donald Alexander, a Washington, D.C., tax attorney and former IRS commissioner, called the ruling harsh and said it could have far-reaching effects. He said it is retroactive and will have a practical effect on tax returns for 1984 and 1985 (which are still auditable) as well as 1986.

May be litigated

"Despite the employee's need for further computer time and the fact that the employer required the use of the home computer, the IRS ruling holds that deductions aren't allowable. That's a tough ruling, and I think it probably will be litigated," Alexander said.

About 80,000 managers for Fortune 2,000 companies used a home computer to do company work in 1985, a figure that will double to 160,000 this year, according to market analysts at Creative Strategies Research International in Santa Clara, Calif.

The IRS ruling was triggered by a tax bill passed by the U.S. Congress in 1984 that established tough standards for taking business deductions on home computers. It said the business investment tax credit and depreciation write-offs are allowable only if the home computer is "required for the convenience of the employer and as a condition of employment."

Last month's IRS revenue ruling interpreted the statute's language using a hypothetical, but typical, case. The case involved an aerospace engineer who used his home computer for company research because the company computers were often being used by other employees during working hours. The home computer was used exclusively for company work, and the employer provided a written statement that the engineer was required to purchase the computer as a condition of employment.

The IRS ruled against any deductions in this case, saying the home computer only helps the employee to work more easily and efficiently. "In order to satisfy the requirement that a home computer is required as a condition of employment, there must be a clear showing that the employee cannot perform properly the duties of employment without it," the ruling said. "That clear showing is lacking in this situation because there is no evidence that the computers supplied by [the company] are insufficient" for the employee to perform his or her duties, it concluded.

IRS revenue rulings set a precedent only for cases with similar facts. But, Alexander said, "It's a fairly typical scenario, and therefore it's a harsh ruling."

For an employee to get a business deduction for a home computer, Alexander said, "the employer would simply have to have a demonstrably inadequate [computer] facility or perhaps no facility at all. "Here the company's computers were not insufficient, but the employee's access was insufficient."

But Lorin Luchs, a tax partner in the Washington, D.C., office of the Seidman & Seidman/BDO accounting firm, said, "I don't think the ruling is any harsher than what Congress intended."

Luchs suggested that, in the view of Congress and the IRS, a home computer used for work is usually for the convenience of the employee, not the company. In some cases, the IRS has disallowed business deductions because the employee could have worked overtime or on weekends and used company facilities.

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VIEWPOINT

EDITORIAL

In defense of information

Picture a computer operator walking into a data center, sitting down at a terminal and loading on to a floppy disk a file critical to a company's financial success — say, key bidding information for a new contract or design specifications for the firm's leading product. If the operator used his own disk, he has a better-than-even chance of eluding prosecution for theft. Why? Because many courts would interpret existing laws to hold that theft can only occur if a physical object, something tangible, has been taken. The only thing the operator removed was information, or knowledge — an entity that in our legal tradition cannot normally be owned and therefore cannot be stolen.

Reconciling that legal tradition with the exigencies of our Information Age is no easy task and is, in fact, a central, though subtle, issue in the continuing debate over how to regulate the use of computerized information. How can we talk of information as a strategic weapon, as a critical corporate asset, and *not* regard its unauthorized removal as a serious crime?

Such questions are central to the continuing public policy debate that will eventually shape our laws to more effectively deal with the abuse of computerized information. Last week the Data Processing Management Association took a step toward becoming an important voice in that debate. In a preliminary report based on nearly five years of research into state computer crime laws, it called on government officials and decision makers to shift their focus from *computer* crime to *information* crime and to shape state laws around the notion that information is a valuable commodity that must be protected from abuse, theft and destruction, computers being only the carriers of that information.

The distinction goes far beyond semantics, and the DPMA is to be applauded for recognizing that fact and for beginning to bring the valuable and unique perspective of its membership into the debate. We can only urge continued and even more aggressive participation by the DPMA and its membership in this critical area of public policy.

Making merry

Three short Christmases ago, you could take your VAX expertise and stuff it in your stocking, for all the good it was doing. But times have surely changed. Ken Olsen is having the last laugh in 1986. And with that ho-ho has come a hiring war for VAX VMS experts that is reportedly spreading across the East Coast like a brush fire.

Apparently, DEC is having a tug-of-war with its own customers — the company needs this scarce talent as much as anyone. What does it all mean?

Certainly, this talent hunt is the clearest sign — other than the profit-and-loss statement — that DEC has not only bucked the slump but has blown it out of the water. It also means VAX VMS programmers will get to experience what a major league pitcher feels when he's just come off a 20-win season and his contract is up. It is the kind of problem that everyone from Blue Bell to Armonk is wishing upon themselves as the holidays arrive. In Maynard, Christmas will be very merry indeed.

INVASION OF THE SYSTEM SNATCHERS
Overnight they turned into something... Different!
They came from France, They came from Japan, They came to his Home Town!
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HONEYWELL

LETTERS TO THE EDITOR

Learning successful data processing

I was a little concerned that there were certain courses missing from the chart, "DP managers rate courses" [CW, Oct. 27], showing the rating of courses by data processing managers in Orange County, Calif. In particular, a course on the concepts and techniques of a structured approach to program design should get high marks for importance from data processing managers.

There is more to programming than knowing the syntax of a language and being able to get the right output. I'm not referring to structured programming but to structured program design.

Since a high percentage of a programmer's time is spent in maintenance and since the DP industry has a history of high turnover rates, though somewhat reduced in recent years, it would seem that more emphasis should be placed on writing maintainable programs. Trying to include structured design techniques in a programming course tends only to give it secondary importance. The design, not the code, is the key to a successful program. A well-designed program not only provides for a maintainable program, but it also helps in the testing phase of program development.

This brings us to another overlooked programming activity — testing. Data processing students are taught the language, and sometimes a structured design tool, but they are not taught how to test their programs. They are never taught any of the program testing methods, much less the proper method, which is testing to see if their program logic is incorrect ("destructive" testing) rather than testing to see if it is correct.

I believe one of the easiest things to learn in data processing is the code or syntax of a programming language. The critical areas are program design and testing. It is bad enough that this was not reflected in the survey. What is discouraging, however, is that those types of courses were probably not even on the list that was given to the managers to rate.

The educators must realize what the problems in data processing are, and the DP managers must insist that those problems be addressed. Certainly no one group is at fault. As managers and educators, we must all be responsible for these problems and give them the priority they deserve.

Robert F. Emert
Systems Specialist, Information Systems
Southwestern Bell Telephone Co.
St. Louis

Weed out disreputable consultants

I am a management consultant, and I agree wholeheartedly with Alan E. Brill's suggestions in his article, "Grilling Your Consultants" [CW, Oct. 27].

As any truly competent consultant will attest, the more effort prospective clients put into weeding out those disguised as consultants, the better the rest of us will be able to function as professionals.

The presence of disreputable "consultants" claiming nonexistent expertise only serves to make people like Brill so suspicious and negative as to compromise the consultant-client relationship before it even gets started.

Lee Gruenfeld
Touche Ross & Co.
Los Angeles

How to integrate CIM

In his article, "Managing the risks of installing CIM" [CW, Oct. 13], William Kimmerly perpetuates the illusion among data processing groups that computer-integrated manufacturing can be accomplished, full blown, from the top down.

Kimmerly does, however, recognize that manufacturing is an open system or, to put it in control engineering terms, an open loop. You cannot control an open loop automatically and must instead close the loops you can and automate and integrate those.

This means you can only successfully realize CIM by integrating from the bottom up with people who understand the systems in question. The real-time world is not the MIS world.

Michael F. Wilson
Engineering and Manufacturing Planning
Du Pont Co.
Wilmington, Del.

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VIEWPOINT

Keeping up with the future: The necessity of reading

By DAVID H. AHL

A noted management consulting firm, suspecting that some of its reports were not being fully read, embedded the following sentence in several reports: "Please send your business card and the copy number of this report to us and we will send you $10." They started the experiment gingerly, putting the sentence toward the end of only a few reports.

After getting no response, they escalated the experiment, finally including the $10 offer in the executive summary of every report. It was only then that they had to send out a few $10 bills, but far fewer than the number of reports produced or people on the routing lists.

These reports were not run-of-the-mill pap. They were produced in response to specific directions from client companies paying between $500,000 and $4 million a year for their consulting services. It must be presumed that the recipients were interested in the contents but were just totally overwhelmed with things to read and absorb. Aren't we all?

Prior to 1500, by the most optimistic estimates, Europe was producing about three new books per day, about 1,000 per year. By 1950, this rate had jumped to 120,000 titles per year, or more than 300 books per day. Today, just 35 years later, publishers in the Western world publish nearly 2,000 titles per day.

Technical articles

Heady as the rate of increase in book publishing is, the rate of increase of articles in technical and scientific magazines and journals is even higher, doubling about every 15 years. On a worldwide basis, scientific literature mounts at a rate of more than 100 million pages per year. Perhaps this is not surprising since 90% of the scientists who ever lived are alive today.

This accelerating rate of progress, particularly in technical fields, makes it extremely difficult to keep up. Moreover, new knowledge both extends and outmodes previous knowledge. In a sense, it forces one to relearn today what one knew yesterday, a feat that is difficult and sometimes impossible. For example, 20 years ago, Lord James, vice-chancellor of the University of York in England, said, "I took my first degree in chemistry at Oxford in 1931. Looking at the questions asked in chemistry today, I realize that not only can I not do them, but that I never could have done them, since at least two-thirds of the questions involve knowledge that did not exist when I graduated."

With knowledge moving at an ever-accelerating pace, it is more true than ever that, as Francis Bacon said, "knowledge is power." Dr. Dennis Waitley, author of *The Psychology of Winning*, puts it in more contemporary terms when he says that one way to move up the ladder is to read voraciously. Reading, he adds, is the major opportunity of which many people fail to take advantage.

Of course, there are reasons we do not read as much as we should. For example, when you lean back to read a book or magazine in your office, do you feel a little guilty? Do you feel that if the boss looks in he'll think you are sloughing off? Or, do you tend to put off reading that long article, saying to yourself, "I'll read it as soon as I finish this busy work," which never gets finished?

Patrick Flannery, operations vice-president of Management Science Associates, admits he rarely takes the time to read a technical book or even a long article in a professional journal. "With my day-to-day work load, I'm lucky if I have time to look at a professional journal every few weeks," he says. He admits to depending upon his operations manager to keep the firm up to date on new techniques.

And how does Dave Schmidt, the firm's operations manager, keep up to date? "I try to attend the annual Digital Equipment Computer Users' Society conference and talk to other users as much as possible," he says, but he admits to not spending as much time reading as he would like.

Moreover, the typical office is not a particularly good reading environment. Educational researchers have long been aware that reading for maximum absorption is done in a quiet atmosphere without distractions.

Keeping abreast

Recognizing the difficulty of keeping up to date, some companies have established groups whose main function is to keep abreast of new developments, evaluate promising technologies and recommend how they should be applied in the company. Jean Golonka, a systems analyst at AT&T, expresses frustration that the only time she has for reading technical literature is at night at home. She relies upon the recommendations of the systems group for new personal computer software and programming techniques.

Were you expecting me to have some sort of solution to the reading problem? Sorry, I don't. The best idea I've heard is to declare a 10-year moratorium on technical publications to let us all catch up.

But since that's not going to happen, I think we must recognize that the only way to cope with the accelerating pace of knowledge, and, indeed, life, is to set aside some high-quality, inviolate time for reading. It should come before the busy work and be in an atmosphere free of noise and distractions. For it is only by giving reading a real priority that we will be able to make the most of the swift, relentless changes of the computer world of today and tomorrow.

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Lessons from the mainframe software community

GUEST OPINION

By DAVID H. BOWEN

In 1969, when I started in this industry, people didn't buy software. They rented their hardware from IBM and the software was bundled with it.

By the early 1970s, the consent decree had changed all that. The bank subsidiary where I worked decided that software purchases would be classified as capital acquisitions. We were purchasing the product and there was an ongoing annual maintenance fee. This was just like other capital purchases the finance department was used to.

As part of this capital purchase decision, we had to look at a total life cycle cost, including training, conversion, maintenance, updates and so on. In fact, payments to the software vendor were always the smallest part of the bill.

A simpler life

With the coming of microcomputer software, life got much simpler. One purchased the software, often on an expense report, and that was that.

The assumption was that for the initial purchase price of the software, one would get unlimited free telephone support so the whole issue of updates never came up.

Then other factors came into play. The first was the classic pyramid phenomenon. Software vendors could give away free support to their early customers as long as there were lots of new customers to foot the bill. The moment sales began to level off, free support began to eat into the profit margins of the vendors.

The second factor was the increasingly large support and maintenance load, which probably surprised software vendors. They assumed they were dealing with a fixed environment and didn't yet understand the realities of software maintenance.

In the mature world of mainframe software maintenance, it was established that most of the maintenance activity was caused by changing requirements. Bugs are really a very small part of the maintenance load. The changes in the external environment and advancing customer expectations create the real work load. Micro software vendors were unprepared for this. The increasing call level on the support lines and the unbearable waits were mute evidence that the system was in distress.

The calls to the hot lines were proof of an even deeper problem for the microcomputer industry. Customers had gone on a buying spree and they were trying to digest what they had bought. They needed support and training to get their solutions implemented.

Software consumers began to react to their disappointment in several ways. The old software warranties that protected the vendors were a focus for political action. California State Assemblywoman Gloria Molina introduced a bill to mandate software warranties, although the bill was defeated by sustained industry lobbying. ADAPSO drew up a draft software warranty that was a self-policing solution to the problem Molina had reacted to.

ADAPSO suggested that vendors identify a product's functions on the package, in the documentation and in the ads and that all of the representations should be consistent. In addition, users should have adequate time to determine if the product matched the product description that caused them to purchase the product. Finally, users should be entitled to either a refund or a new version that fixes any deficiencies.

I have been associated with a number of small software vendors introducing new products and believe that a 30-day, money-back guarantee is critical. I have been on the phone with a number of upset, angry users who were having problems with my product. Once I said I would refund their money, 90% of them calmed down and started to work out the problem with me. Very few wanted their money back.

Surprise and confusion

Decisions by major micro software companies to charge for support have been met by surprise and confusion. Users believed they had paid for free support when they purchased the product and that vendors were changing the deal after the fact.

Furthermore, some of the new costs seem out of line with what users are accustomed to paying for mainframe products. As one customer said, paying $4,000 a year for maintenance on a $395 product was hard to understand when he only paid $1,500 a year for support on a $50,000 mainframe software product.

The mainframe software community had to learn how to provide and charge for maintenance; the microcomputer software community must learn many of the same lessons. Vendors and users alike should study the history of the more mature markets so that they can avoid repeating the same mistakes.

Bowen is a software marketing and business consultant in San Jose, Calif.

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

Competing to tune of DB2

In recent weeks a sense of foreboding has grown among the independent software vendors as they feel that IBM, limping from a slowdown in hardware revenue, has turned to software for the company's future growth.

The two most frequently cited examples of this are IBM's aggressiveness in marketing DB2 — observers have noted, "They're practically giving it away" — and IBM's 20-year deal with financial applications vendor Hogan Systems, Inc..

Before the gnashing of teeth gets out of hand, it might be wise to take stock of a few facts. The first is that most of the independents' ire has been directed at the Hogan deal and what it portends, while most of the damage has been done by DB2. Nearly everyone agrees with the assessment of Broadview Associates' partner Bernard Goldstein that the Hogan deal represents an acquisition by IBM but isn't being called that. At ADAPSO's 25th anniversary meeting in Phoenix last month, Goldstein concluded: "The Hogan deal is not an isolated incident of IBM filling a small niche. I believe that IBM is implementing a strategy to dominate multiple horizontal and vertical software lines."

By extension, it is assumed that IBM can do this at will, simply by giving its marketing muscle a new twist. If you don't believe that, just look at what

See **COMPETING** page 22

Babcock is Computerworld's *senior editor, software & services.*

Legislators praise data base

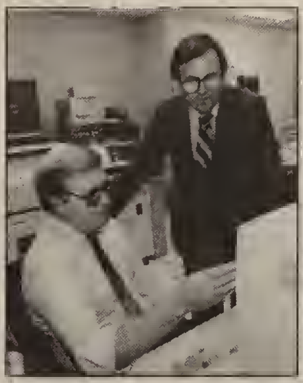
Text management system speeds political process

By Jean Bozman

SPRINGFIELD, Ill. — When legislators stand on the floor of the Illinois House of Representatives, they debate under the watchful gaze of portraits of Stephen Douglas and Abraham Lincoln.

But the past is not all that is present. In between the portraits are two 12-foot-high computerized scoreboards that display a 30-character summary of a bill about to be voted on, one of the more visible signs of the legislature's text data base management system.

The text system was implemented by Legislative Information Services (LIS), a group separate from other state MIS organizations. Originally called Alter and now marketed under the name TextDBMS from Data Retrieval Corp. in Milwaukee, the system is used in state agencies in Georgia, Massachusetts, Texas and a few federal agencies. Except for the insurance industry, however, text management has found few commercial users so far. The Illinois legislature system provides an example of how the product can be used on a large scale.


Russell (left), Hatcher

Through a special software bridge, Alter is teamed up with IBM's IMS data base management system to allow legislators to write and rewrite bills and track changes to legislation before it becomes law.

The process is backed up by a special office called the Legislative Reference Bureau, where 15 lawyers are able to query the DBMS to search for legal precedents and draft new bills.

One of the strong points of the system, according to LIS deputy director George Russell, is its ability to support the legislative process. "We've taken the computer and

See **LEGISLATORS** page 20

Firms to launch DB2 dictionaries

By Charles Babcock

Officials of a small Florida software company say the firm is about to bring out a data dictionary that works with IBM's DB2 relational data base management system because IBM apparently has no plans to do so.

An official of a large DB2 users group, however, says IBM is likely to offer a data dictionary soon, without waiting for its Repository project to bear fruit.

At the same time, officials from Sage Systems, Inc. in Rockville, Md., acknowledge they are planning to bring out a DB2 catalog extender that will function as a data base administration tool. The product was developed at an early DB2 user site, Deere & Co., a farm equipment manufacturer in Moline, Ill. Deere officials described their Data Management System (DMS) to members of the Midwest DB2 Users Group in Chicago last week.

Craig Lange, the Deere DMS designer, told the users group that Deere developed the DB2 tool between March and August last year to get around limitations in the DB2 catalog, according to Richard Finkelstein, vice-president of the group.

DMS is capable of copying the DB2 catalog into a separate data base where a data base administrator is able to paint data entities, such as the views, rows, columns and tables used in defining a new data base. Descriptive text may be added to the data entities, which is not possible with the DB2 catalog, Finkelstein relates.

Arthur Balter, manager of marketing at

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INSIDE

ADR enhances migration software for VSAM applications/**20**

Lawson plans DB2 version of financial series/**21**

Pansophic adds flexibility to its application generator/**22**

NEW THIS WEEK

- Sterling Software enhances its Dyl-Inquiry
- For more on this and other new products, see pp. 101-130.

INSTANT ANALYSIS

"IBM's commitment to SQL-compatible data base products strongly suggests that the principal motivation behind IBM's aggressive marketing of DB2 is its desire to establish an SQL market standard."

— William H. Shattuck, researcher at Montgomery Securities, a San Francisco brokerage house.

SI's users welcome takeover by Computer Associates

Greet ownership by software-only firm

By Ninamary Buba Maginnis

BOSTON — Software International Corp. (SI) users surveyed recently at their annual conference say they look forward to their vendor being owned by a software-only company.

General Electric Co., parent of SI, has signed a letter of intent to sell the subsidiary to Computer Associates International, Inc., a mainframe systems firm in Garden City, N.Y.

"When we first heard of the takeover, we were a little bit concerned. You know that GE as an owner will be here until whenever," said Jim Karney, manager of financial systems and development for the Wilkes-Barre, Pa., C-Tec Corp., which is a telecommunications company that uses SI's Masterpiece series of accounting software.

But C-Tec DP staff sometimes wondered if GE knew its subsidiary existed, Karney added. "Now we feel Software International is owned by a computer company," he said.

John Tower, systems analyst at the Poughkeepsie, N.Y., facility of Alfa-Laval, Inc., based in Fort Lee, N.J., said his firm uses both Computer Associates and SI products. "We have used Computer Associates products since 1980. Mainly we're pleased with the quality of their products," Tower said. Alfa-Laval is a Swedish-owned industrial manufacturer. The company has had little need to call on Computer Associates' support, but when it has, "they were very efficient," Tower said. "Computer Associates is a known [entity] to us. They've been profitable in the past when there was a lot of competition and some companies were not making a lot of money."

Computer Associates is expected to report revenue in the neighborhood of $255 million at the end of its fiscal year on March 31, making it a candidate for being the largest U.S. software company.

One concern Tower voiced was that Computer Associates is not known as a minicomputer software maker. Alfa-Laval recently transferred its SI accounting packages from an IBM mainframe to an IBM System/38. "We're going to be watching very closely to see what decision they make in the IBM small systems market," Tower noted.

The acquisition puts what is primarily a systems house into the applications business, Computer Associates spokesmen said. "It seems to be a good marriage from the mainframe point of view because a lot of the inefficiencies occur between the interacting of system and application software," Tower said.

"GE was a good company but we expect to see good things out of Computer Associates," said Betty Azzollini, a systems manager of Whippany, N.J.-based Channel Home Centers, a home repair retail chain owned by W. R. Grace & Co. "They're not as diversified as GE is. Software is their field," Azzollini said.

Ned Palmer, a senior analyst for Columbus, Ohio-based Cardinal Industries, a modular home builder, noted Computer Associates has a broad product line of on-line software. "It will probably do nothing but help Software International with more on-line facilities," he said.

SI Users Group Vice-Chairman Carl Coulter, a systems planning consultant for New York-based McGraw-Hill, Inc., checked into Computer Associates' financial record and came away "impressed with what Computer Associates has done in the software business," he said.

ADR migration software accepts VSAM files

By Charles Babcock

PRINCETON, N.J. — Applications designed to run under IBM's VSAM files can be migrated to Applied Data Research, Inc.'s Datacom/DB relational data base management system with an enhanced piece of migration software.

Release 2.0 of the ADR/VSAM Transparency from the Princeton-based mainframe systems house owned by Ameritech now supports batch as well as on-line program migrations. The programs may be written in Cobol, assembler, PL/I and IBM's RPG and may be written to run. under either IBM's OS, DOS/VSE or MVS and MVS/XA, according to Stephen J. Gerrard, ADR director of product marketing.

Release 2.0 includes a previously established capability to migrate files used by a VSAM application into a format usable by Datacom/DB.

The old VSAM applications, however, continue to run as if the VSAM files existed. The migration software intercepts calls to VSAM files and redirects them to the newly created files, supplying data in the correct format, ADR officials said.

The new release also supports VSAM operations more extensively than its predecessor, which was first launched in May 1983. Gerrard said ADR/VSAM previously did not support Read Backwards, a little-used VSAM operation. It now supports that operation and others previously excluded, boosting ADR/VSAM's coverage of VSAM commands from 90% to 97%, he claimed.

Although users sometimes "take a confusing number of record types and kludge them together into one VSAM file," Gerrard said, migrating them to Datacom/DB will allow them to be listed in tables by record type. Even though the records may still be stored together, "to the end user it looks like separate tables," he said.

ADR/VSAM costs $25,300 for the version that runs under OS and MVS operating systems and $20,000 for a DOS/VSE environment. Monthly, three- and five-year licenses are also available.

Legislators praise data base

From page 19

adapted it to do what the legislators want it to do," he says.

Alter runs under IBM's MVS operating system, using VSAM sequential files to store passages of text on an IBM 4341 or 4381 processor.

"Information is created once a bill is introduced on the floor of the House or Senate," says John T. Hatcher, executive director of the 30-member LIS group. "Once created, it is then tracked throughout the whole system by IMS. But legislators actually write the bill using Alter."

The bridge between Alter and IMS allows changes to the laws to be recorded in the IMS master files. The IMS system can report the status of a bill from introduction to passage. Finally, the LIS computers drive a set of photocomposition devices, which produces camera-ready copy of the law in its printed form.

When the laws are ready to be voting upon on the House or Senate floor, an IBM Series/1 minicomputer reformats the information from Alter for a 30-character summation on the scoreboards.

On the floor of the House or Senate, the clerk may add notations to the scoreboard by pressing a number of preprogrammed function keys. The keys bear such labels as "motion to table" or "two-thirds vote required." The subsystem was custom-designed by a South Dakota firm that also made the electronic voting boxes on each legislator's desk.

"One of the advantages of this kind of system," says Stanley Johnston, executive director of the Legislative Reference Bureau, "is that people are no longer intimidated by paper. It's easy to let them do drafts and revisions of laws, and we encourage them to revise the drafts we do for them."

Before the LIS started building the text management and voting system 15 years ago, secretaries were faced with cutting and pasting by hand copies of revised bills. The typing pool has shrunk over the last decade from 10 to three typists as electronic text processing diminished the text makeup work load.

The clerk of the House, Jack F. O'Brien, says he believes that Illinois was a pioneer when it installed Alter on an IBM 370/168. The 370 used up its capacity running the LIS work load.

But as the system evolved, legislators have grown dependent on its ability to keep them up to date. Before it was installed, O'Brien recalls, "the Speaker of the House would call a bill and start the voting while the representatives would still be scrambling to find it in their papers." That no longer occurs, O'Brien notes.

Even the executive branch has turned to Alter to simplify its work. During the last four years, the LIS text data base system was used to compile a single set of state codes for the entire executive branch including all state agencies. The project was able to reduce a roomful of books to a set of five paperbound volumes by eliminating repealed laws and duplicated ones.

"We used Alter to input all those rules into a single data base," LIS's Russell says.

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Lawson to offer DB2 version of Pinstripe financial series

By Jean S. Bozman

Lawson Associates, Inc. anticipates a market will open up for financial applications that are compatible with IBM's DB2 relational data base product. That is why the Minneapolis applications developer plans to market a new DB2-compatible edition of its Pinstripe set of financial applications.

The move, set for January, is in keeping with the company's traditional bias toward using data base query techniques to update general ledger applications. The first database-compatible software Lawson sold after its founding in the mid-1970s was designed for use with Unisys Corp.'s, formerly Burroughs Corp.'s, DMS II data base.

Later, the company wrote financial applications for IBM's System/38, which has a data base system built into its operating system. In the last year, Lawson also introduced Pinstripe versions compatible with Applied Data Research, Inc.'s Datacom/DB relational data base management system and Software AG of North America, Inc.'s Adabas.

Ken Holec, president of the $14 million firm, says that DB2-compatible products were a natural progression from earlier versions of Pinstripe products. The line includes a general ledger package to others for payroll, accounts payable and accounts receivable.

Prices for each Pinstripe DB2 package will be around $100,000 — more than twice the cost of similar DOS and OS/MVS products sold by Lawson to IBM 4300 and IBM 3080 mainframe family users.

This week, Lawson plans to install the product at its first commercial site, the Federal Home Loan Bank in Seattle. The product should be available sometime in the first quarter of 1987, Holec said.

The DB2 line uses standard SQL calls to achieve a link with DB2, according to Richard Lawson, company founder and chairman. "We use preprogrammed inquiries and reports, all written in Cobol," said Lawson, who designed the new software.

However, users are advised not to try to update the DB2 data base from the Pinstripe software. That, Lawson said, should be done through IBM system utilities.

Each application package allows ad hoc inquiries of the DB2 data base as the end user prepares a financial report. Lawson's installed base is currently 700 sites, about 100 of which are large IBM mainframe sites.

Bozman is a Computerworld *contributor based in Chicago.*

Firms to launch dictionaries

From page 19

Sage, confirms that Sage had purchased the marketing rights to the catalog extender from Deere and will field-test the product in February. He says he expects it will be made available in June or July at a price in the $20,000 to $25,000 range.

Sage will continue to develop the product, seeking to grow it into a full-fledged data dictionary and add a command painter in IBM's SQL that will make it easier to do ad hoc queries against the data base. The command painter would also be able to store previously used SQL commands for future reference, Balter says, but he adds that no date has been set for when such a product would be available.

The lack of a data dictionary is one of the most frequently voiced criticisms of DB2, now estimated to be installed in more than 1,000 large mainframe sites.

Repository system

IBM is known to be working on a repository system to serve as a terminal, a device definition facility as well as a global data dictionary across multiple systems.

But IBM has not committed itself to a date for when such a product would be available, nor has the company made any commitment to a DB2 dictionary.

Finkelstein says many DB2 users in the Midwest DB2 Users Group believe IBM is at work on its own data dictionary for DB2 and will announce a product shortly.

Timothy Bryce, director of marketing at M. Bryce & Associates, says officers from his company attended IBM briefings for third-party software developers at which they were told IBM did not plan to offer a data dictionary for DB2.

Developed interface

Bryce had developed an interface between his company's Information Resource Manager, a data dictionary installed at 50 IBM mainframe sites, and DB2. The dictionary has been available since June, when it was broken out of Bryce's Pride information systems development methodology formerly marketed as a package by Bryce, Timothy Bryce says.

The Information Resource Manager dictionary is priced at $45,000, with an additional $10,000 price tag on the DB2 interface, Bryce says. The interface generates SQL statements for creating tables, views and indexes to be used with DB2.

In addition, it can be used with other SQL-based relational systems, including Ingres from Relational Technology, Inc., and Oracle from Oracle Corp.

The mainframe dictionary runs under IBM's MVS and MVS/XA.

Versions are available to run under the Digital Equipment Corp. VMS operating system for the VAX and the GCOS operating system from Honeywell, Inc., Bryce says.

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Competing to tune of DB2

From page 19

IBM has done with DB2, the independents might say.

But perhaps these two issues should be kept separate for a moment. There is no question that DB2 has impacted the revenue of the independent DBMS vendors. Cullinet Software, Inc. just reported its second losing quarter in the company's history, and, unquestionably, revenue has been slowed at Applied Data Research, Inc. and Software AG of North America, Inc. as well.

There is an exception to this rule, however, and it reflects what I think is the market's appetite for relational technology. Cincom Systems, Inc. introduced a relational data base management system called Supra one year ago, and it appears to be competing head-to-head with DB2. Supra possesses a data dictionary, referential integrity and a fourth-generation language, features that DB2 lacks. Since April, Cincom has sold 150 copies of Supra at prices that range from $193,000 to $274,000, higher than DB2 was in the first year of the sale. Cincom had hoped to sell 110 copies at this point; the 150 figure makes Supra Cincom's most successful product launch, according to Cincom President Dennis Yablonsky.

If this were an isolated example, it wouldn't necessarily disprove the other independents' view. But other companies offering relational technology, particularly those combining it with IBM's SQL data access language — Relational Technology, Inc., Oracle Corp. and Unify Corp. — have also been 1986 success stories.

The independent software companies have staked their existence in the IBM world on the fact that they can develop superior technology and do it before IBM can develop a marketing plan. It would be easier to sympathize with them at this juncture if they hadn't profited for years by IBM's foot-dragging in software.

Cullinet Software achieved its status as a darling of Wall Street by selling its IDMS as superior to IBM's IMS. As many users recall, when IMS was launched 16 years ago it was difficult to use and was plagued with bugs. Possibly it is this kind of competition for which the independents are now nostalgic.

But the market has changed. IBM is in part responsible for that by pushing relational technology at some risk to IMS and its own revenue stream. C. J. Date, Edgar Codd and other writers contributed by preparing the market for this change.

Set-at-a-time processing, ad hoc queries against large data bases, faster application development — these are among the advantages that users are seeking in relational technology. Evidently, users have less confidence in finding these advantages 10 years down the road in hierarchical or networked products.

For the independents to complain that IBM threatens them with a DB2 club is to miss the point. They have made their reputation by offering sophisticated technology at competitive prices, and the market has confidence in their ability to do so. Now they have little choice but to toe the line and compete.

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Prototyper made flexible

OAK BROOK, Ill. — Increased flexibility in building prototypes is reportedly one of the features of Release 1.5 of a large application generator, named Telon, from Pansophic Systems, Inc.

Telon operates in IBM's IMS/DC, CICS and batch modes and can be used to build a prototype that demonstrates screen flow with data, data edits and error messages before a compiled Telon application has emerged.

Analysts using Release 1.5 can use select fields, field edits and program flow control to create such a prototype, according to spokesmen from Pansophic.

Full-function model

Screen flow in the prototype can also be based on the contents of data entered into a field. The feature allows an analyst to demonstrate a full-function model of an application with screen flow based on menu screen selection, according to company spokesmen.

Cross-reference reports have been added to the automated documentation in Release 1.5. The reports allow users to cross-reference either a single data element, multiple data elements, all data elements in library members or, if chosen, all data elements used in the generation of Telon applications.

Data analysts can use the cross-reference reports to see where and how each data element is used in the Telon application generator, Pansophic spokesmen said.

Estimating maintenance

The cross-reference reports also gives development managers another tool for estimating the amount of work that is necessary when it comes time for maintenance, spokesmen said.

Release 1.5 ranges in price from $130,000 for the CICS/VSAM environment to $285,000 for the IMS/DC environment, Pansophic spokesmen said.

Telon competes with such application generators as APS from Sage Systems, Inc., Pacbase from CGI Systems and Use-it from Higher Order Software, Inc.

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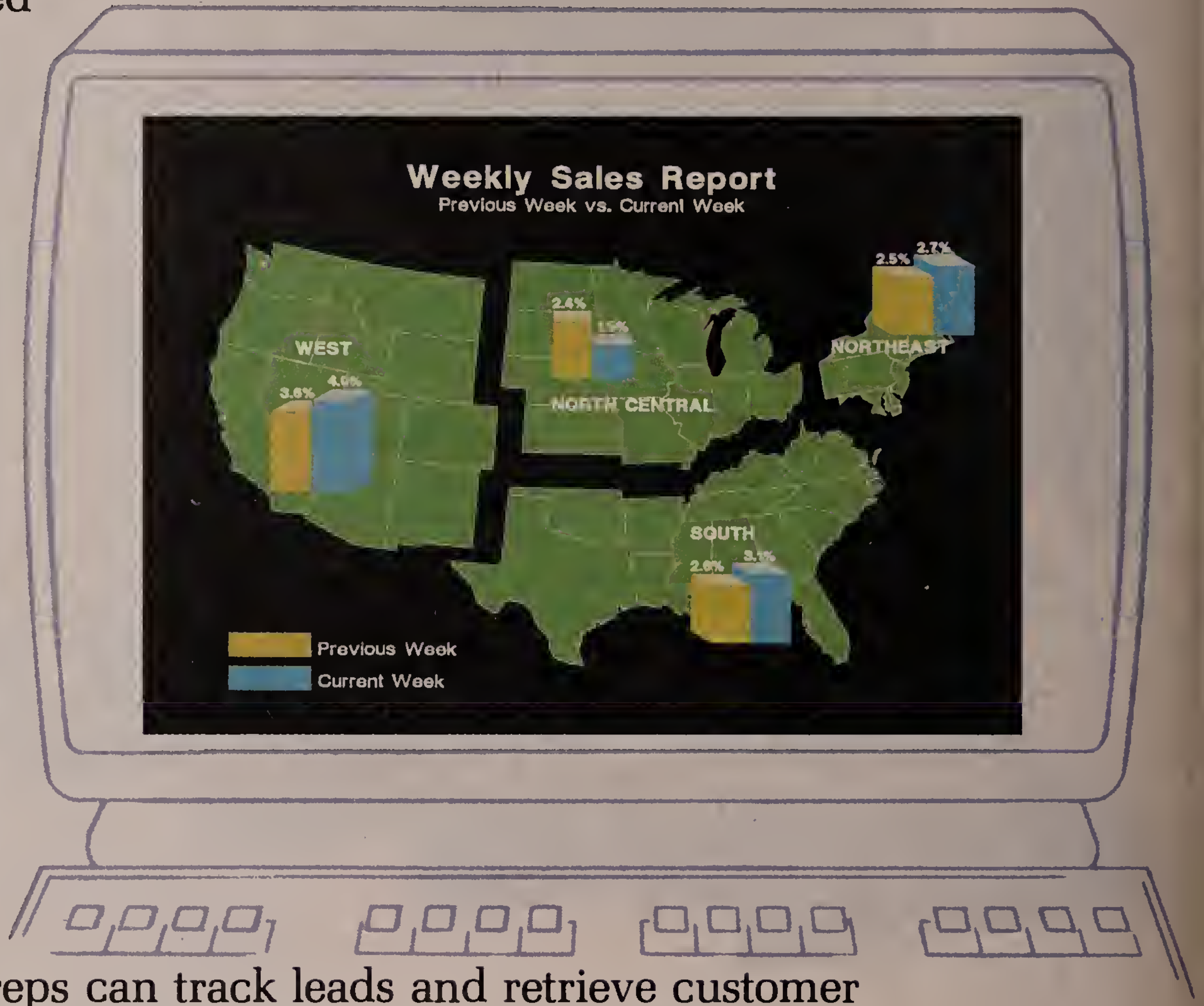
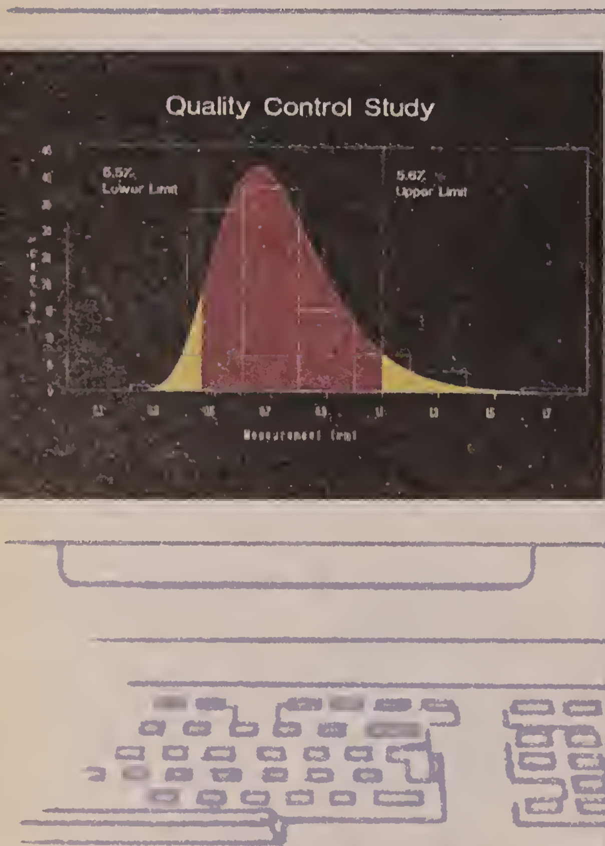
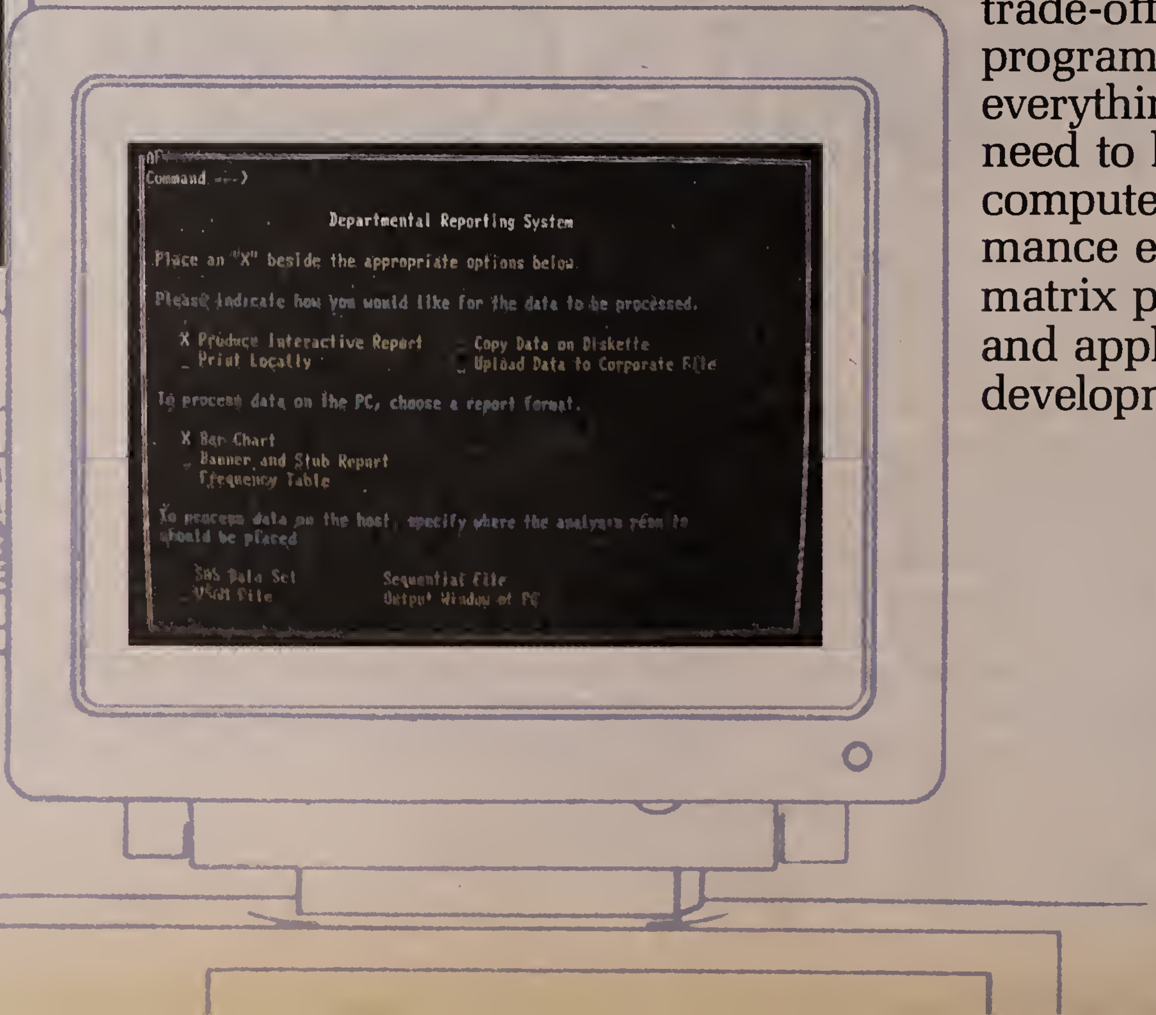


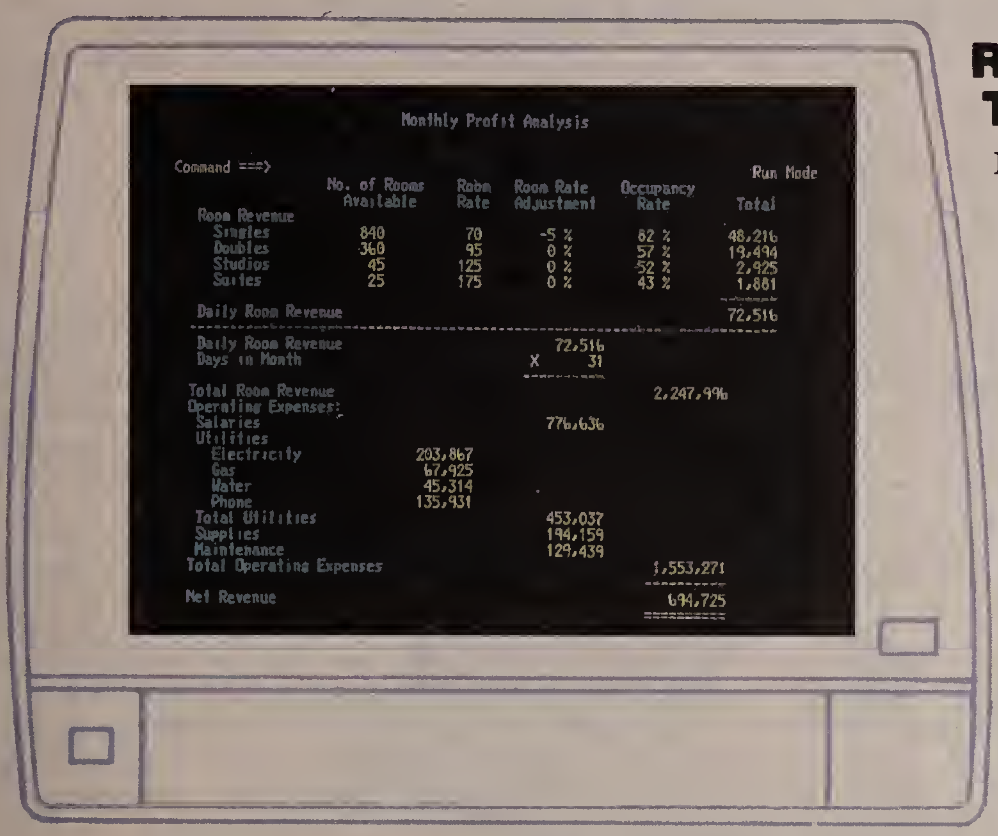
But ease of use shouldn't be confused with lack of power. We eliminated that trade-off by giving programmers everything they need to handle computer performance evaluation, matrix programming, and applications development.





```
Command ---)

                 Departmental Reporting System

Place an "X" beside the appropriate options below.

Please indicate how you would like for the data to be processed.

  X Produce Interactive Report      _ Copy Data on Diskette
  _ Print Locally                   _ Upload Data to Corporate File

To process data on the PC, choose a report format.

  X Bar Chart
  _ Banner and Stub Report
    Frequency Table

To process data on the host, specify where the analysis results
should be placed

    SAS Data Set              Sequential File
  _ VSAM File                 Output Window of PC
```

SYSTEM



```
                         Monthly Profit Analysis

Command ===>                                                         Run Mode
                 No. of Rooms   Room   Room Rate    Occupancy
                   Available    Rate   Adjustment     Rate           Total
  Room Revenue
    Singles          840         70      -5 %         82 %          48,216
    Doubles          360         95       0 %         57 %          19,494
    Studios           45        125       0 %         52 %           2,925
    Suites            25        175       0 %         43 %           1,881
                                                                   -------
  Daily Room Revenue                                                72,516
 ---------------------------------------------------------------------------
  Daily Room Revenue                             72,516
  Days in Month                                X     31
                                               --------
 Total Room Revenue                                         2,247,996
 Operating Expenses:
  Salaries                                      776,636
  Utilities
   Electricity              203,867
   Gas                       67,925
   Water                     45,314
   Phone                    135,931
  Total Utilities                               453,037
  Supplies                                      194,159
  Maintenance                                   129,439
 Total Operating Expenses                                   1,553,271
                                                           ----------
 Net Revenue                                                  694,725
                                                           ==========
```

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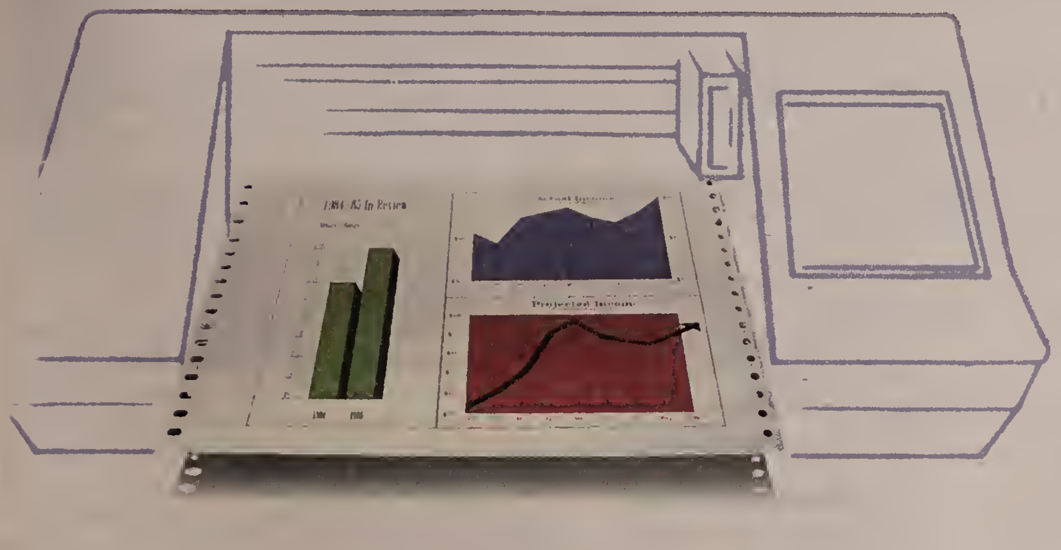

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Mini gains retrieval package

TRUMBULL, Conn. — A minicomputer capable of running IBM VM/CMS applications has been packaged with Pansophic Systems, Inc.'s Easytrieve Plus information retrieval, report writer and data management system.

Canaan Computer Corp. in Trumbull, Conn., has signed an agreement with Pansophic to offer the end-user retrieval and reporting system on its DCS 5800 minicomputer, a departmental-level processor designed to compete with IBM's 4361 minicomputer.

In addition to Easytrieve Plus, the EZ/Key prompter and editor designed to work with Easytrieve is being sold in the package along with an auditing package, Panaudit Plus, also from Pansophic. The combination is aimed at internal auditing and reporting functions and has been installed at Singer Corp. in Stamford, Conn., Canaan spokesmen said.

A typical DCS 5800 can support up to 36 users on IBM Personal Computers, IBM 3178 and 3278 terminals, Digital Equipment Corp. VT100 and VT220 terminals, Canaan graphics monitors and terminals and other ASCII terminals. The product costs $51,000, Canaan officials said.

Easytrieve Plus and EZ/Key are available from the Oakbrook, Ill., software supplier for a $10,500 permanent license. Panaudit Plus is available for $9,000.

On-Line extends Ramis credit to renters of competing Focus 4GL

By Alan Alper

FORT LEE, N.J. — On-Line Software International, Inc. has kicked off marketing efforts for its recently acquired Ramis fourth-generation language by going after users who rent a competing language product marketed by Information Builders, Inc.

On-Line is offering to credit all 1986 customer rental fees paid for Information Builders' Focus fourth-generation language toward a 36-month equity lease of Ramis Information. After the lease expires, the user will own the Ramis license, the firm said.

For example, a Focus user who rented the fourth-generation language for eight months in 1986 will make 28 monthly payments to On-Line to lease Ramis for 36 months, the company said. A 36-month lease costs $3,945 for OS shops, $1,390 for DOS shops and $2,205 for CMS shops, the firm added.

The offer is good through Feb. 27, 1987, On-Line said.

Leading language

Alice Kessler, On-Line's vice-president of marketing, explained that On-Line targeted Focus because it is considered the market's leading fourth-generation language and is very similar in syntax and functionality to Ramis.

"Also, our market research showed that a lot of people rent Focus and don't actually own it," she noted. "We thought if there are people who are not happy with it, they might give Ramis a try."

On-Line acquired Ramis, a fourth-generation language with an integrated data base managment system, from Martin-Marietta Data Systems, Inc. in October along with three other software lines and the sales force handling those products for $35 million [CW, Oct. 23].

Firm unveils interface for data analysis

By Charles Babcock

ATLANTA — Knowledgeware, Inc. has announced an interface for its data analysis tool, Data Designer II, and Cullinet Software, Inc.'s IDMS/R data base management system.

The Knowledgeware interface generates physical data base structures or schema definitions in IDMS/R syntax from the fully normalized logical data models produced by Data Designer II.

Data Designer II is a mainframe tool that creates logical data models in third-normal form from end-user data requirements.

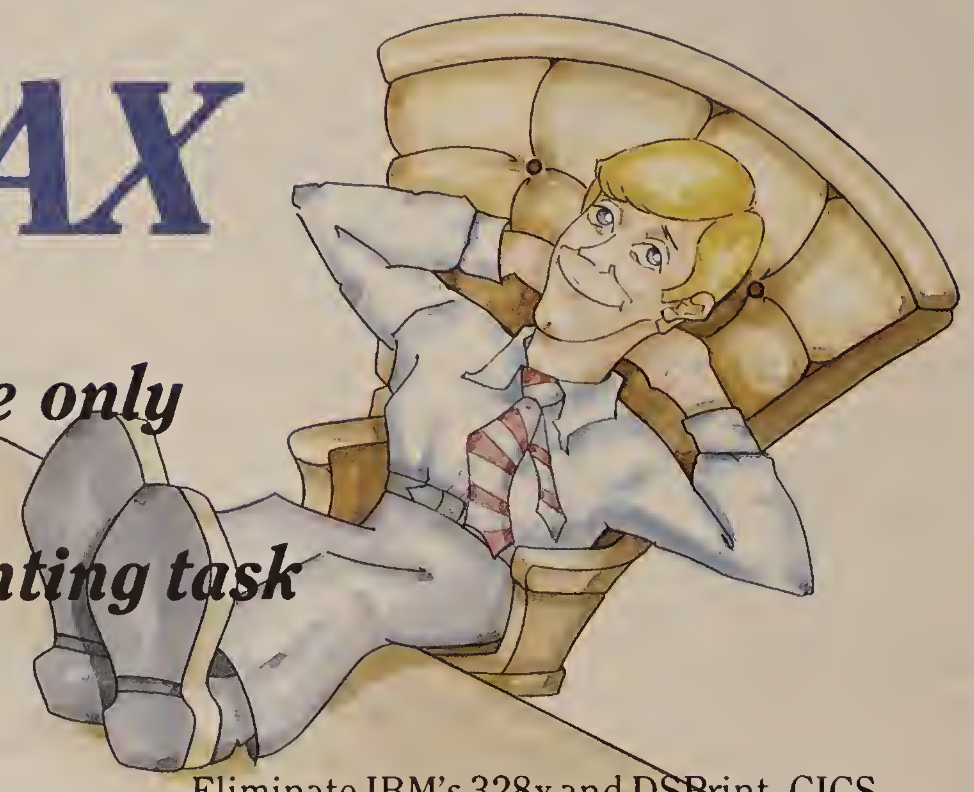
The logical models serve as the design for shared data bases that will be used to implement physical data bases.

Knowledgeware is the company founded by software theorist and author James Martin to create software tools reflecting his theories of data base design and use.

Martin's firm recently merged with Tarkenton Software, Inc., owned by Fran Tarkenton, the former professional football player turned productivity maven.

The interface to IDMS/R, with an estimated installed base of 2,200 to 2,300 sites, will allow the Data Design II tool to be used at a larger number of IBM mainframe sites, Knowledgeware spokesmen claimed.

The interface is priced at $7,500, according to Knowledgeware.



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   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government — State/Federal/Local
   - 65. Public Utility/Communications Systems/Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agriculture
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer Service Bureau/ Software/Planning/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other ____________
   - 95. Vendor: Other ____________

2. **OCCUPATION/FUNCTION** (Circle one)
   - 11. President/Owner/Partner/General Manager
   - 12. VP/Assistant VP
   - 13. Treasurer/Controller/Financial Officer
   - 21. Director/Manager/Supervisor DP/MIS Services
   - 22. Director/Manager of Operations/ Planning/Admin. Serv.
   - 23. Systems Manager/Systems Analyst
   - 31. Manager/Supervisor Programming
   - 32. Programmer/Methods Analyst
   - 35. OA/WP Director/Manager/Supervisor
   - 38. Data Comm. Network/Systems Mgmt.
   - 41. Engineering/Scientific/ R&D/Technical Mgmt.
   - 51. Manufacturing Sales Reps/Sales/ Marketing Mgmt.
   - 60. Consulting Management
   - 70. Medical/Legal/Accounting/Mgmt.
   - 80. Educator/Journalist/Librarian/Student
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   - A. Mainframes/Superminis
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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Page printers: A time to buy

In everyday life, the term "buyer's market" usually means prices for things like houses and cars aren't rising quite as fast as they were last month. The prices don't necessarily fall, but they aren't escalating the way they were.

However, a buyer's market in the computer industry often means customers can get more product for less money. It is a phenomenon that leads to measurable gains for customers and appears ready to strike certain segments of the printer market.

The managers and users who stand to gain in the upcoming buyer's market are those involved in buying and using nonimpact page printers in the medium-performance range. Depending upon whose definition is used, the mid-range starts at between 12 page/min. and 20 page/min. and extends upward toward the 70 to 90 page/min. performance mark. There is general agreement, however, that the printers are those used with networks of personal computers and minicomputers in departmental, distributed DP and small business environments.

According to analysts and vendors interviewed recently, some vendors plan to flee the price wars of the entry-level printer market to enter what has been a comparatively stable mid-range market at the same time that users expect more functionality from the laser printers and other page printers that have been serving the middle

See **PAGE** page 33

Connolly is Computerworld's *senior editor, systems & peripherals.*

AT&T unveils 32200 chip

Answer to Intel, Motorola third-generation products

By James Connolly

BERKELEY HEIGHTS, N.J. — AT&T last week unveiled its answer to high-powered microprocessors such as the Intel Corp. 80386 and Motorola, Inc. 68030 with the introduction of its 32-bit WE 32200 Microprocessor and Peripherals.

AT&T officials claimed the 32200 offers more than twice the performance of its predecessor, the WE 32100, which was introduced in April 1985. The 32200 central processor and four peripheral chips are intended for use in multiuser and multitasking systems, particularly Unix-based systems in markets that include commercial data processing, office automation, file processing and industrial control.

"The WE 32200 chip set will enable customers to upgrade their systems to new technology and higher performance devices as their applications demand. All of the members of AT&T's microprocessor family have been designed to meet customer needs for systems evolution and upward migration," said Al Hofmann, AT&T Technology Systems manager of microprocessing marketing.

A key difference between the 32200 and the Intel and Motorola products is the use of an integrated 4K-byte data cache on the 32200 memory management unit. That cache is large enough to run applications and to provide for zero-wait state memory access, said Arlon Martin, market segment manager for microprocessors. He said other vendors use separate static random-access memory (RAM) chips for caching.

In addition to the CPU, the chip set includes the memory management unit, a mathematics unit, a direct-memory access controller and a dynamic RAM controller.

Engineering samples of the 32200 are scheduled to be available in the second quarter of 1987 with production shipments later in the year. Unit prices in quantities of 100 are $500 for the CPU, $550 for the memory management unit and cache and $425 for the math acceleration unit.

DATA VIEW

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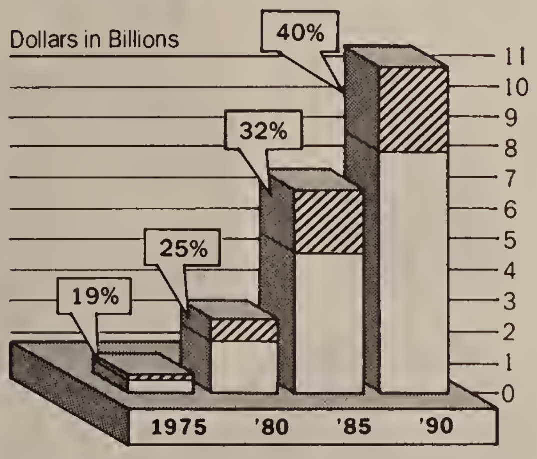
Service calls

Maintenance, software and training provide growing share of Digital Equipment Corp. revenue.



Information provided by estimates from the Yankee Group.

Supermini cast at laboratories

By Rosemary Hamilton

WESTFORD, Mass. — Masscomp has introduced an entry-level model of its 32-bit superminicomputer line for use in real-time scientific applications.

The Scientific Laboratory System is a preconfigured system based on the Motorola, Inc. 68020 and runs under a Masscomp-modified version of the Unix operating system, which is based on the AT&T Unix System V and incorporates features of the University of California at Berkeley Unix Version 4.2, the company said.

Included with the system, which costs $29,900, is the Laboratory Workbench, a software package that enables scientists to manipulate data through the use of icons,

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INSIDE

Tektronix unveils a ruggedized graphics terminal for the shop floor/**31**

Honeywell announces a replacement for its VIP 7824 terminal/**31**

NEW THIS WEEK

- Tektronix offers a software driver for Sun workstations
- For more on this and other new products, see pp. 101-130.

INSTANT ANALYSIS

"Two years ago, the big thing was you could get something for under $10,000. Now they are talking about under $2,000."

— Analyst Naomi Luft of Datek Information Services, Inc. on falling laser printer prices

CCI's Cunningham: Unix 'hot boxes' make firm sizzle

But integration needed for long-term survival

By James Connolly

WALTHAM, Mass. — The term "hot box" arises every few minutes during a talk with John F. Cunningham. It comes up when he talks about his company's current product line, product development efforts and prime asset.

Cunningham sees the ability to design and build hot boxes — high-speed Unix engines — as the key asset of Computer Consoles, Inc. (CCI), the firm that he and other former Wang Laboratories, Inc. executives took control over last year.

"We will have a good company that is interested in providing solutions to the marketplace. But the thing that is really different about the company is that we are a very good designer and manufacturer of really hot boxes," says Cunningham, who became chief executive officer and chairman of CCI after leaving his job as president of Wang.

During a recent interview, Cunningham outlined CCI's strategy, acknowledging that CCI probably will not be a long-term survivor as an independent computer maker.

"I think that CCI is coming from too small a position to stay as a long-term independent survivor," observes Cunningham, noting that IBM and Digital Equipment Corp. are likely to be among those few survivors.

CCI's Cunningham

"As I look out over a 15- to 20-year period, I think there will be a lot of consolidation in this business," he says. "If I go out 20 years, I figure there won't be more than five or six major players left. If you go out five or six years, you're going to have about 25 companies that think they can be one of those five or six survivors. I think that CCI, over a 20-year time frame, will be an integral part of one of those surviving companies."

Cunningham hints that work force reductions, bringing in his own management team and developing hot boxes are measures largely aimed at short-term success in the superminicomputer market and for long-term positioning for a union with a larger company. About 450 employees have been let go, leaving the company with a work force of about 1,200. Only two of 18 vice-presidents remain in the positions they held when Cunningham took over in June 1985.

Cunningham says that CCI now has the management team he wants and that positive results are appearing. CCI reported its first profit in seven quarters, 13 cents per share, for the quarter ending Sept. 30. Cunningham uses a football term when asked about the next step. "Blocking and tackling, executing the strategy," he replies.

He reports that with some enhancements, CCI's primary products — low-end Motorola, Inc. 68000-based systems; high-end, proprietary technology 32-bit superminis; and

See **BOXES** page 33

Sun Microsystems, GE join to sell solids modeling system

Target workstation for high-end mart

By Rosemary Hamilton

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. announced recently that it will team up with General Electric Co.'s Silicon Systems Technology Department (SSTD) to offer a solids modeling workstation based on the Sun-3 workstation line and the SSTD Graphicon 700, a processor designed for three-dimensional, graphics-intensive applications.

The system, which will be sold jointly by the two vendors, will compete directly with the Iris workstation line from Silicon Graphics, Inc., which targets its products at the high end of the engineering workstation market.

"This kind of graphics performance — we've tested it at 200,000 vectors per second — we just didn't have in-house," said Gordon Short, Sun's manager of strategic alliance marketing. "This allows us access to markets that we didn't have before."

The Graphicon 700 was introduced earlier this year. The Calma Co. division of GE and Masscomp, have announced they will incorporate the very large-scale integration graphics processor into their product lines.

According to Sun, the solids modeling system will range in price from $55,900 to $99,400. The lower priced model will be based on a diskless monochrome Sun-3/75 with 4M bytes of main memory, which is not expandable. The high-end solids modeling system will be based on the Sun-3/260, which comes with 8M bytes of main memory, a 280M-byte disk drive, a 60M-byte cartridge tape and the Sun floating-point accelerator.

Supermini cast at labs

From page 29

menus and pop-up displays instead of having to write code.

Along with the 68020 microprocessor, the system comes with a Motorola 68881 floating-point coprocessor, 4M bytes of main memory, which is expandable to 8M bytes, a 75M-byte disk drive and a 13-in. monochrome monitor. The Masscomp operating system, RTU, is also included.

According to Stephen Kirk, marketing director of Masscomp's scientific products group, the new model is 100% compatible with the company's other systems.

Kirk also said the Masscomp version of Unix is compatible with the AT&T Unix System V and can run those software programs that run under System V.

Users can add support of Ethernet and X.25 networking protocols as options to the Scientific Laboratory System.

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Model 860: The Model 860XL offers draft and correspondence printing and is ideal for spreadsheets and forms up to 16 inches wide.

Tektronix strengthens 4208 unit for shop floor

By Rosemary Hamilton

BEAVERTON, Ore. — Tektronix, Inc. has announced that it will introduce a ruggedized version of its 4208 color graphics terminal for the shop floor in mid-1987.

The SF4208 will cost $5,495 and offer the same features as the 4208, according to Tektronix.

The ruggedized 4208 color graphics terminal has a 13-in. screen with 640 pixel by 480 pixel resolution and offers 512K bytes of main memory.

Series extension

It is an extension to the 4200 series, which was introduced earlier this year to replace the 4100 series of graphics terminals.

The 4208 was redesigned to include a sealed keyboard, filtered cooling system and a shielded CRT.

It can withstand temperatures from 0° to 50° C and up to 95% humidity, Tektronix said.

The terminal is designed for manufacturing applications, particularly those requiring the display of computer-aided design data.

It is compatible with the Digital Equipment Corp. VT100 terminal and has VT200 alphanumerics compatibility.

Tektronix also plans to offer a $200 sealed keyboard for its 4200 terminals, as well as its 4109A and 4111 terminals.

Honeywell adds printer, terminal

By James Connolly

BILLERICA, Mass. — Honeywell, Inc. has announced a replacement for its VIP 7824 terminal and unveiled a high-performance serial printer for use with its DPS 6 and DPS 6 Plus minicomputers.

The Honeywell Display Station (HDS) 7 was designed to replace the VIP 7824 terminal. Priced at $1,200, the HDS 7 is less than half the price of the older model. The HDS 7 reportedly can be used with the DPS 6 and the DPS 6 Plus as well as with other Honeywell systems such as the DPS 4, DPS 7 and DPS 88.

According to Honeywell, the visual presentation features and data-editing and form-validation capabilities of the HDS 7 make it appropriate for applications such as inquiry response, on-line data entry, inventory management, customer file maintenance, production control and scheduling, financial applications, transaction processing and sales order and office processing.

The company said that the monitor houses the power supply and logic assembly and that ergonomic features include tilt and swivel. The 14-in. screen is available in green or amber. The screen features 800- by 350-dot resolution and can display 80 or 132 characters per line.

The HDS 7 is reportedly available with either a standard keyboard or a multilingual keyboard with 12 programmable function keys.

The printer is the Model 46 dot matrix printer, which the company said has a noise rating of less than 55dB. It can print in data-quality mode at 400 or 480 char./sec. and in near-letter-quality mode at 70 char./sec.

The Model 46 is said to allow users to choose from a variety of fonts through the use of two font cartridges at a time.

The printer can communicate with a host system directly or via a modem with an RS-422A or RS-232C interface and Honeywell Asynchronous Serial Printer Interface protocols. The Model 46 costs $3,495.

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*As reported in the March 1986 edition of *DataQuest*.

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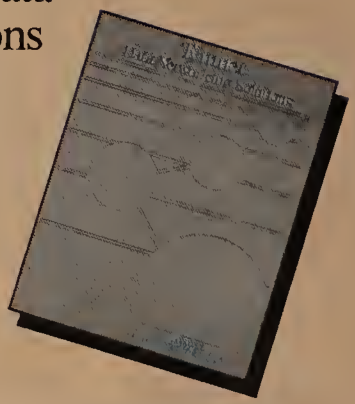

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Boxes make firm sizzle

From page 29

Officepower integrated office software — will carry CCI into 1988 in its various markets.

But even though CCI claims to provide performance of up to 8 million instructions per second (MIPS) with its single-processor Power 6/32 supermini, Cunningham is counting on its next generation of systems.

"There's plenty of product through 1987 and probably the first half of '88. We get long in the tooth in product in late 1988, '89. I am currently funding at a rate in excess of $7 million a year an advanced technology product that is a 50-MIPS reduced instruction set computer (RISC) done in 1.2-micron low-power CMOS, scheduled to be available in the early '88 time frame," he says.

While developing that RISC system, CCI plans to fill out its product line with systems such as a Motorola 68020-based Power 5/32 by early 1987 and low-cost versions of the 8-MIPS Power 6/32 and the 5-MIPS Power 6/32E.

Those lower cost models, introduced recently, use less expensive disk drives and tighter packaging than their predecessors.

Building 50-MIPS CPU

Cunningham and his associates are concentrating on building a 50-MIPS CPU and a network of resellers, OEMs and value-added resellers (VAR). The system design by the Irvine, Calif.-based supermini systems group is coordinated by former Wang developers Harold Koplow and David Moros. Former Wang marketing executive John Jacobson heads the distribution realignment. That effort was kicked off in February and has resulted in contracts with 41 VARs.

The VAR approach is a strategy shift for CCI, which relied in the past on a handful of OEM contracts, a few direct sales — primarily to law firms and governments — and turnkey contracts with communications companies such as MCI Communications Corp. and the regional telephone companies. Much of the communications revenue has come from the sale of directory assistance systems. Cunningham says CCI succeeds in communications because of its ability to tie large data bases to central office switches.

He says that $40 million of CCI's $130 million in revenue comes from long-term leases — principally for directory assistance systems — and field engineering within its installed base. He says the $40 million represents a dependable cash flow that has made CCI attractive to investors.

In addition to building an independent sales organization of VARs and office equipment resellers — who add their own software to CCI engines and Office Power — CCI hopes to expand its OEM business.

Cunningham reports that

See **BOXES** page 34

Page printers: Time to buy

From page 29

range for several years.

To take full advantage of this, users will have to demand more than lower prices. The applications that are driving the page-printer market — including such relatively new uses as desktop publishing and traditional data processing and office automation applications — require flexibility. Users will not achieve the full benefit of page-printer technology if they can use it for nothing more than emulating a line printer.

What users are demanding are features such as duplex capabilities, standardized page description languages and the ability to use varied types of paper. (One page-printer vendor is even demonstrating the ability to produce quality images on sandpaper.) These features should be available in the middle range and, users can hope, at lower prices than they are paying today.

If it is true that new vendors are moving into the middle range of the printer market, then users should be able to arm themselves with the threat of moving to alternative vendors if their current suppliers fail to provide the appropriate functionality and pricing.

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Boxes make firm sizzle

From page 33

CCI has three OEMs — the former Sperry Corp. (now merged with Burroughs Corp. and known as Unisys Corp.), Harris Corp. and ICL Ltd. — but that the company needs five or six. He also notes that the OEM business has not been lively and that CCI plans to add Institute of Electrical and Electronics Engineers, Inc. floating-point capabilities and more powerful languages to its products for technical markets.

"Sperry, Harris and ICL are basically selling into their base. These guys aren't driving an awful lot of really new applications. I think we can get a chunk of it ourselves, but you need those product characteristics or you won't do well in that marketplace," Cunningham says. He maintains that confusion from the Sperry and Burroughs merger hurt OEM sales but that Burroughs officials assured him that CCI's Sperry deal is safe because the Power 6/32 products do not compete with Burroughs products.

Cunningham says CCI can succeed in the OEM and VAR markets by adhering to standards and continuing to produce high-performance processors with good data base and fault-tolerant characteristics.

"I have the technology, but I haven't had the distribution to drive the technology on the marketplace. Given our product line, I have to steal $40 to $50 million from somebody else next year. That would move us from $130 million to $165 to $170 million, which is probably what we want to do next year. Those are multibillion-dollar marketplaces. We figure the other people must be screwing up enough that we should be able to steal some business," he adds.

Little customer demand

Cunningham says that while he hopes to develop and sell a 50-MIPS processor, there has been little customer demand for the company's current high-end product, the 15-MIPS Power 6/32 MP dual processor.

He predicts that CCI will drift away from proprietary hardware in the middle range, with Motorola 68030-based systems likely to move into the 5-MIPS market, but that the company will continue with proprietary high-end hardware in conjunction with industry-standard Unix and communications capabilities.

He says that moving to RISC, which Hewlett-Packard Co. was among the first to adopt, is not a major gamble. "HP was early on into the thing. I think that RISC is what the next generation of processors is going to be. If I was a $1 billion to $5 billion company and I wasn't on top of that technology, I would be doing a disservice to my organization," he comments.

Cunningham also says some supermini firms are gambling by not adopting industry-standard operating systems. "DEC might be able to set VMS as a standard. But everybody else in the business is going to come to the realization in the next three or four years that they are not going to be big enough to push their own proprietary network. I don't think the users will stand for proprietary. I don't think they like it now. They have too many incompatible systems."

CCI has taken criticism, in particular from Patty Seybold's Office Computing Group, for wavering on a commitment to Officepower, which the consulting group praised for its functionality and interface. CCI officials countered that they had re-evaluated the strategic importance of Officepower, apparently because customers said they buy CCI boxes because of the software package.

> **"**
>
> ***'DEC might be able to set VMS as a standard. But everybody else is going to come to the realization that they are not going to be big enough to push their own network.'***
>
> **— John Cunningham**
> **Computer Consoles, Inc.**

"They have good Unix boxes and impressive office software. Unfortunately, they are selling the two together. For people who already have an office solution with Unix hardware, CCI is out because they won't unbundle Officepower," says Seybold Managing Editor Ronni Marshak, who maintains that CCI should port Officepower to other vendors' hardware. Jacobson responds that CCI has done such porting for major customers but that CCI is not in the software-only business.

Cunningham says Officepower is a key in CCI's strategy. He claims it is as user-friendly as DEC's All-In-1, with the power of CCI processors handling the overhead of Unix, and a better product than Data General Corp.'s CEO and Wang's Wang Office.

The subject of Wang also arises when Cunningham is asked why he moved to CCI.

"Starting in 1975, when the company had a market value of $30 million, I drove it to $5 billion. I figure I never got the credit for doing that. I got the credit for being the sales guy and outside spokesman. I'm not going to take this company from a $60 million market cap to $6 billion, but I'm going to take this company from $60 million to probably $600 or $700 million just to let everybody know that, hey, I did that," Cunningham says.

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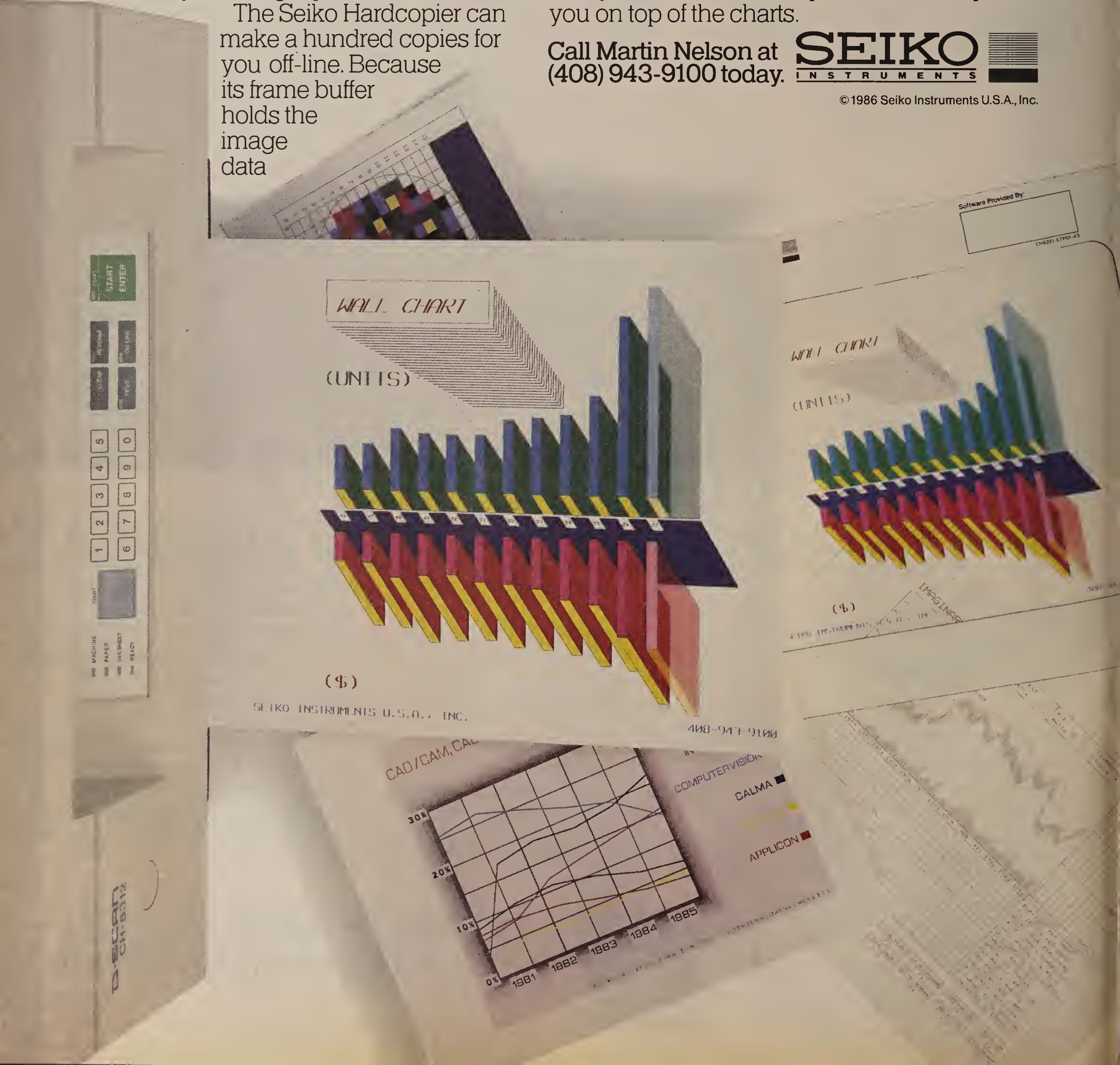

COMMUNICATIONS

DATA STREAM
Merv Adrian

Dictionary key to data access

Why, you might ask, are we talking about data dictionaries in a data communications column? Because as end-user demand for corporate data base access reaches critical mass, MIS departments are realizing that they cannot make do with file transfer alone. All those products designed to move information from mainframe data bases to a more readily accessible location — to a micro, mini or what have you — must be able to handle data at the record and field level. And that requires interacting with data dictionaries.

Not to belabor the obvious, but how many significant production files can you move to your personal computer or even to that big file server you just installed without either exceeding your storage size or effectively locking out everything else? Take even an Intel Corp. 80386-based machine with a gigabyte's worth of hard-disk storage. How much can it do with a single file that takes up most of its main memory?

What business users want is not file exchange but information exchange — the process of getting only the information they want in the form they need it onto the processor most appropriate for handling it. For this to happen, data must go through a series of processes on the mainframe:

- Extraction, or selecting specific types of fields with cer-

See **DICTIONARY** page 47

Adrian is chairman of the micro-to-mainframe Special Interest Group of the New York PC Users Group and senior programmer/analyst at Shearson Lehman Brothers, Inc.

Micom links LAN, PBX

By Elisabeth Horwitt

BOXBORO, Mass. — Micom Systems, Inc.'s subsidiary, Micom-Interlan, has announced the long-awaited link between its Ethernet local-area network (LAN) product line and Micom's data private branch exchange (PBX).

The company also introduced additions to its Network Terminal Server family that allow Digital Equipment Corp. Microvaxes and RS-232 devices to communicate over an Ethernet local-area network using Transmission Control Protocol/Internet Protocol (TCP/IP).

The Network Terminal Server 470 (NTS470) multiplexes eight asynchronous lines between a Micom data PBX and a Micom-Interlan LAN. This enables workstations on Ethernet to access hosts attached to the data PBX and workstations linked to the PBX to access hosts on the LAN, according to Stephen Young, Micom-Interlan manager of end-user products.

NTS470 allows terminals to access hosts using Telnet, a TCP/IP-compliant virtual-terminal protocol.

The NTS470 LAN-to-PBX link is based on another Micom-Interlan introduction, the NTS100 terminal server. The subsidiary's first terminal servers to support TCP/IP, NTS100 allow up to eight RS-232 devices to share access to an Ethernet LAN, the company said.

Micom and Interlan first made their intentions of linking their respective product lines known during the formal announcement of the two companies' merger in the spring of 1985.

The NTS470 connection creates an integrated communications system out of complementary networking products, Young noted.

Micom already has an installed base of

See **MICOM** page 43

Digital net management arrives

Bell South paves way with secondary channel

By Elisabeth Horwitt

Tariffs recently filed by Bell South Corp. companies Southern Bell Telephone and Telegraph Co. and South Central Telephone Co. promise to move end users closer to the long-awaited goal of customer-controlled network management for digital data service lines.

Tariffs that are either currently in effect or scheduled to take effect by the end of first-quarter 1987 offer secondary channel support for Synchronet, a digital data service offered within both divested Bell operating companies' local access transport areas. Separately filed tariffs, scheduled to take effect Jan. 1, would provide local users with access to long-distance digital data services with secondary channel support.

The secondary channel support could carry diagnostics, network usage information "or just about anything users wanted," a Southern Bell spokesman said. The feature would also enable users to monitor AT&T Dataphone Digital Service (DDS) lines with the same central network management systems that are currently used to manage analog networks, according to Paul Baxter, a spokesman for Racal-Milgo, Inc. The vendor announced in September a diagnostic data service unit (DSU) with secondary channel support and has already had "several orders from customers anticipating Southern Bell's tariff," Baxter said.

One such customer is Bank South Corp. The Atlanta firm has ordered 77 Racal-Milgo DSUs with secondary channel support to be installed in approximately 65 locations.

The network will support a range of applications including branch office, automatic teller machine and office automation networking, according to Bud Rambo, Bank South assistant vice-president and telecommunications manager.

"Our network is currently split in two," he explained. The company uses digital

See **DIGITAL** page 47

INSIDE

Ameritech teams up with David Systems to develop ISDN-type service/**39**

Octel integrates its voice messaging system with Rolm PBXs/**42**

Market for digital and T1 lines grows/**42**

NBI introduces Disoss gateway/**43**

NEW THIS WEEK

- CXI introduces a 5250 gateway
- For more on this and other new products, see pp. 101-130.

INSTANT ANALYSIS

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— David Melin, networking product marketing manager, Microsoft Corp.

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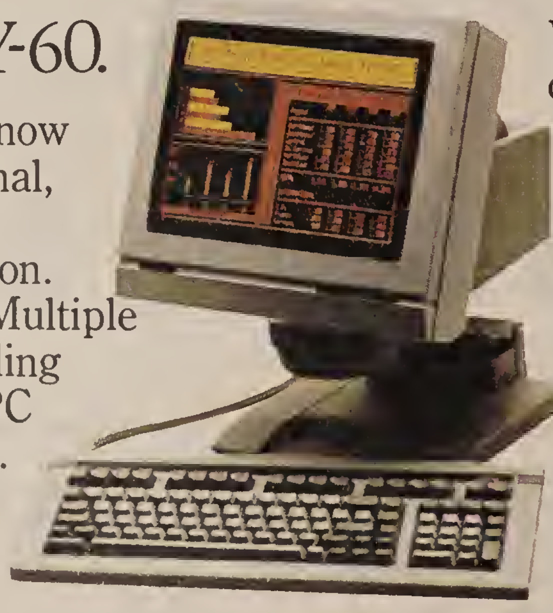

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Ameritech to offer David Systems' ISDN-like network

LAN targeted for Centrex customers

By Eddy Goldberg

CHICAGO — Ameritech Development Corp. recently announced a $3 million research and development partnership with David Systems, Inc., based in Sunnyvale, Calif., to provide Integrated Services Digital Network (ISDN)-like services to Centrex customers over ordinary twisted-pair telephone lines.

"This new technology from David Systems will integrate high-speed data transmission with central office-based business communication systems," said John Wray, vice-president of development at Ameritech. Field trials of the technology are planned for spring 1987.

When it becomes available in the second half of 1987, the communications system will offer Centrex customers a high-speed Ethernet local-area network (LAN), plus digital voice and terminal data communications capabilities without requiring the customers to purchase the equipment themselves, said Luigi Mercurio, David's president and chief executive officer.

Monthly service charge

Instead, customers will pay a monthly service charge to their divested Bell operating company.

David will also offer the system to other telephone companies, Mercurio said. Ameritech has offered the David Manager voice and data switch as customer-premise equipment since March 1985.

"We think a central office-based LAN has a lot of appeal to large business customers," an Ameritech spokesman said. Using Ameritech's network services allows customers to avoid paying capital equipment expenditures as well as the cost of installing coaxial cabling, according to the spokesman.

In addition, the modular, central office-based David system can be reconfigured easily to support a greater or smaller number of users, he noted. Ameritech's divested Bell operating companies will take care of network maintenance on a 24-hour-a-day basis.

Simplified management

Network management also will be simplified with the LAN based in the central office, Mercurio said. "Having a David hub located at the central office provides a central administration for voice and data. The customer can rearrange the central station for voice and data in the same way."

The Ameritech spokesman described the service as a precursor to ISDN and claimed that it will be ISDN-compatible and communicate with other ISDN-compliant network services when they arrive. "We see a strong demand for this product well out into the 1990s," he said.

The current David product, the David Manager, provides services beyond ISDN with four channels, Mercurio said.

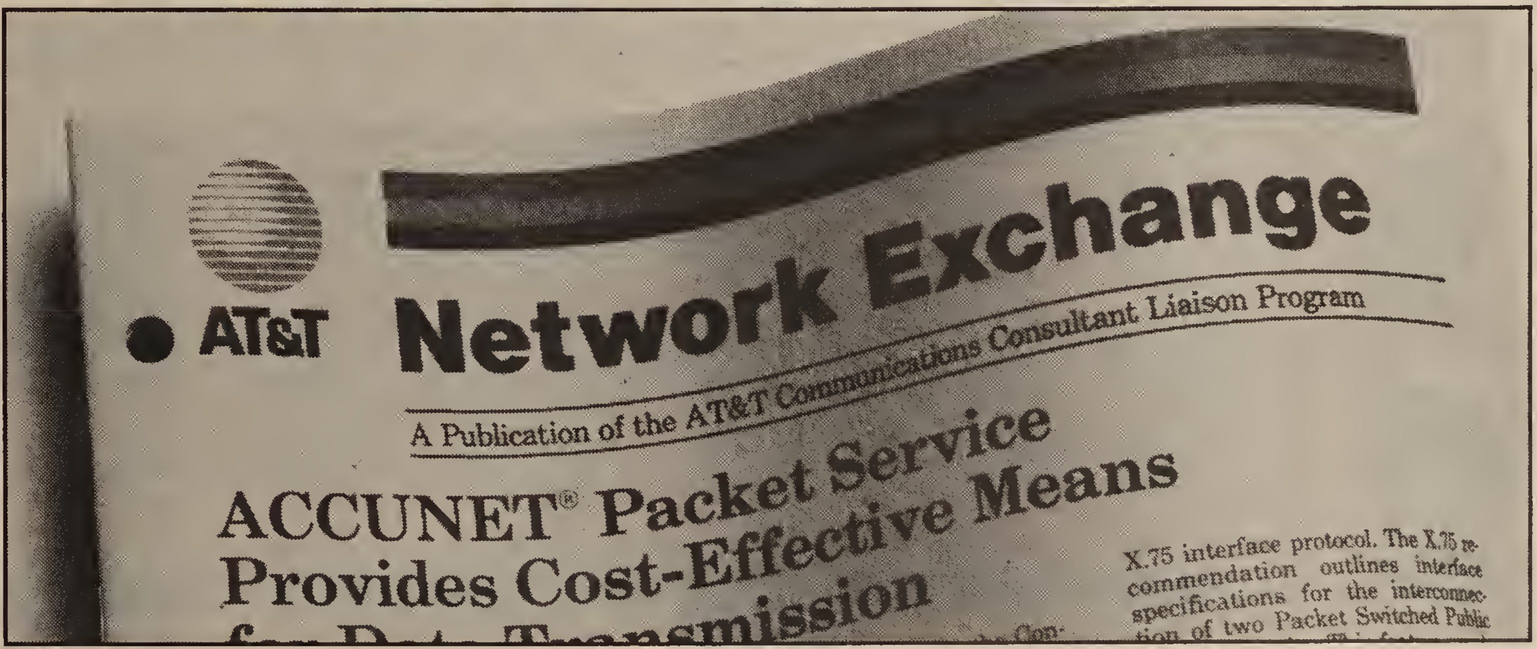
Three channels — two 64K bit/sec. B channels for either voice or data and one 64K bit/sec. D channel for signaling — correspond to the ISDN basic interface. ISDN defines a basic D channel of 16K bit/sec.

The David Manager's fourth channel carries Ethernet packets at speeds of up to 1M bit/sec. for each user line and up to 10M bit/sec. over the Ethernet backplane of the David system.

The David system supports an optional fiber-optic link, which supports rates of up to 24M bit/sec. between the customer premise and the central office. This bandwidth can be divided up between RS-232 and Ethernet connections.

The product being developed with Ameritech is an enhancement of current David offerings and will mark the first time David's switch will be located in the central office, Mercurio added.

AT&T IS IN SMARTER PROPOSALS.



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T-1 Open Systems Integration (OSI)—A Technical and Strategic Review

Leader: Harold C. Folts,
Executive Director, OMNICOM Inc.

Enroll in this intensive one-day tutorial for a thorough understanding of the concepts and terminology of OSI, a working knowledge of the OSI architecture, an introduction to the seven layers of OSI protocols, and expert guidance in applying OSI to the evolution of distributed information systems. *Level:* Intermediate.

T-2 ISDN—Status and Developments

Leaders: James G. Herman, Director, and Mary A. Johnston, Senior Consultant, Telecommunications Consulting Group, BBN Communications

In this tutorial you'll learn what ISDN will and won't deliver in the late 1980s, what the emerging ISDN standards will mean in terms of new services and improved network performance, what holes still exist in the standards and trials, how to make smart buying decisions while keeping open your options for ISDN compatibility, and more. *Level:* Intermediate.

T-3 Strategic Planning for Corporate Information Networks

Leader: Dr. Howard Frank,
Howard Frank Associates

Attend this tutorial to learn how to relate vendor offerings and technological trends to your organization's needs and requirements, and to develop a framework to plan future services and systems. You'll examine current issues in network integration, why communication departments must function as "mini telcos," and the pros and cons of software defined networks and private dedicated networks. *Level:* Introductory–Intermediate.

T-4 Planning and Designing Networks with the New Technology

Leader: Dr. John M. McQuillan,
President, McQuillan Consulting

In this intensive seminar, you'll get acquainted with the key architectural principles used by today's leading network planners. You'll review emerging technologies such as T-1 networks, hybrids, VSATs, gateways between SNA, LANs and X.25, micro-mainframe links, and intercompany networks. You'll learn how to plan a corporate network using advanced technologies. *Level:* Advanced.

T-5 Building the Network Management and Technical Control Facility

Leader: Gabriel Kasperek,
President, Kazcom Inc.

This one-day course will help you understand the strategic value of network control, explore alternative technologies for managing your network, and discover how to evaluate current technologies for use in your own organization. You'll become familiar with the test equipment you need for successful network control, and understand industry trends and future directions. *Level:* Introductory–Intermediate.

T-6 Designing Voice and Data Networks Under the New Tariffs

Leader: Robert L. Ellis,
President, The ARIES Group Inc.

Take this tutorial to learn the structure of the post-divestiture tariffs, the latest January 1987 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics involved in configuring data networks, the LATA-pure strategy, and more. *Level:* Intermediate.

T-7 Managing the Telecommunications Resource

Leader: Gerald P. Ryan,
President and Founder,
Connections Telecommunications Inc.

This one-day course briefs you on how to develop a successful management environment. You'll learn what tools are available to do your job more professionally, how to plan a network management center, how to staff and train the department, and how to prepare and substantiate departmental budgets. *Level:* Intermediate.

T-8 IBM Token-Ring Versus Other LAN Choices

Leader: Dr. Kenneth J. Thurber,
President, Architecture Technology Inc.

This tutorial gives you an across-the-board overview of announced products, future plans, compatible products, and IBM's overall strategy with respect to Token-Ring technology. You'll discuss the Token-Ring's relationship to IEEE 802.5, the IBM cabling systems and hosts, get an in-depth look at NETBIOS and APPC/LU 6.2 interfaces, and more. *Level:* Intermediate.

T-9 VSAT Technology and Implementation

Leader: Dr. Jerome G. Lucas,
President, TeleStrategies

Learn the basics of applying very small aperture terminal (VSAT) satellite communications to your networking needs. You'll get acquainted with basic application requirements in SNA networking, data broadcasting, PC networking, video broadcasting, and teleconferencing. *Level:* Intermediate.

T-10 IBM's Systems Network Architecture (SNA): A Detailed Road Map

Leader: Daniel Zatyko,
President, Zatyko Associates

Enroll in this intensive one-day tutorial to understand the evolution of SNA, and learn fundamental SNA concepts—the seven SNA architectural layers, SNA's physical and logical addressing, strategic SNA products, components of NetView, Token-Ring networks, functionality and capabilities of the LU 6.2/APPC and NETBIOS interfaces, and more. *Level:* Intermediate.

T-11 An Introduction to Data Communications Today

Leader: Gary Audin,
President, Delphi Inc.

This course introduces you to the basic concepts, terminology and technology of data communications. You'll learn how various networks operate and how to select them; how best to interconnect computers, terminals, and PCs using different protocols; and what software is necessary to support protocols and network management. *Level:* Introductory.

T-12 Understanding the Communications Regulatory Environment

Leader: Richard E. Wiley,
Senior Partner,
Wiley, Rein & Fielding

Enroll in this tutorial to learn how telecommunications policy is made and changed, what agencies are active in policy making, how industry segments are affected by current policies, what key issues are now under consideration, and how you can influence future decisions. *Level:* Introductory

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Octel links voice mail system to Rolm PBX

By Stanley Gibson

MILPITAS, Calif. — Octel Communications Corp. recently announced the PBX Integration Device, which integrates the company's Aspen voice messaging system with all Rolm Corp.'s private branch exchange (PBX) systems.

The device is designed to replace an existing interface between Aspen and Rolm's CBX 8000, based on the PBX vendor's Electronic Telephone System (ETS). According to Octel, Rolm's decision to discontinue support of ETS last April left a number of Aspen users stranded since it effectively made Octel's ETS-based link obsolete. In supporting communications protocols for all Rolm's Computerized Branch Exchange (CBX) systems, including the 8000, the PBX Integration Device solves this problem, Octel said.

The device enables the PBX and voice messaging system to trade information so, for example, the PBX's message-waiting indicator will go on if the user has voice mail to pick up.

ETS discontinuation

The discontinuation of the ETS affects only CBX 8000 customers. Users of the CBX 9000 can continue to use Aspen systems with or without the PBX Integration Device, an Octel spokesman said.

Octel's Aspen systems compete directly with Rolm's voice messaging product, called Phonemail, which works with Rolm PBXs.

Octel "had to come up with a new device when Rolm phased out its Electronic Telephone System, through which Aspen had previously been integrated with the CBX," commented Doane Perry, a telecommunications analyst with International Data Corp., a Framingham, Mass., research firm. "Octel is now well integrated; that's the point," Perry added.

Octel's Aspen systems are currently integrated with Rolm's CBX, Northern Telecom, Inc.'s SL-1 and SL-100 PBX and nine other PBX models from various manufacturers, according to Octel.

Increased use of T1 lines widens market growth

By Elisabeth Horwitt

LA JOLLA, Calif. — A shift toward the increased use of digital and 1.5M bit/sec. T1 lines has opened up the market for growth in related areas such as T1 multiplexers, a recent Computer Intelligence Corp. report claims.

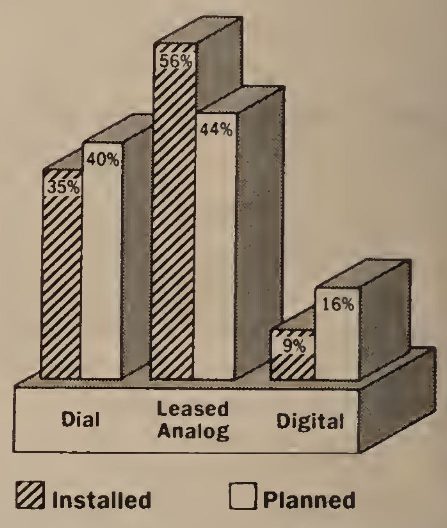
Based on telephone interviews with communications managers and other decision makers from more than 11,000 sites, the report finds that while dial-up and leased analog lines continue to predominate in current and planned user installations, there is an overall trend toward using a greater percentage of digital lines (see chart below).

The research firm points to "considerable growth in T1 facilities" during a six-month period. As of October 1986, T1 equipment was installed in 8% of the interviewed sites and planned in 5% of the sites. As of April 1986, 5% of the interviewed sites had T1 facilities, while 4% planned to install such facilities, according to Computer Intelligence researchers.

JEFF BABINEAU

Communications lines

Fall survey shows digital overtaking analog in the corporate arena



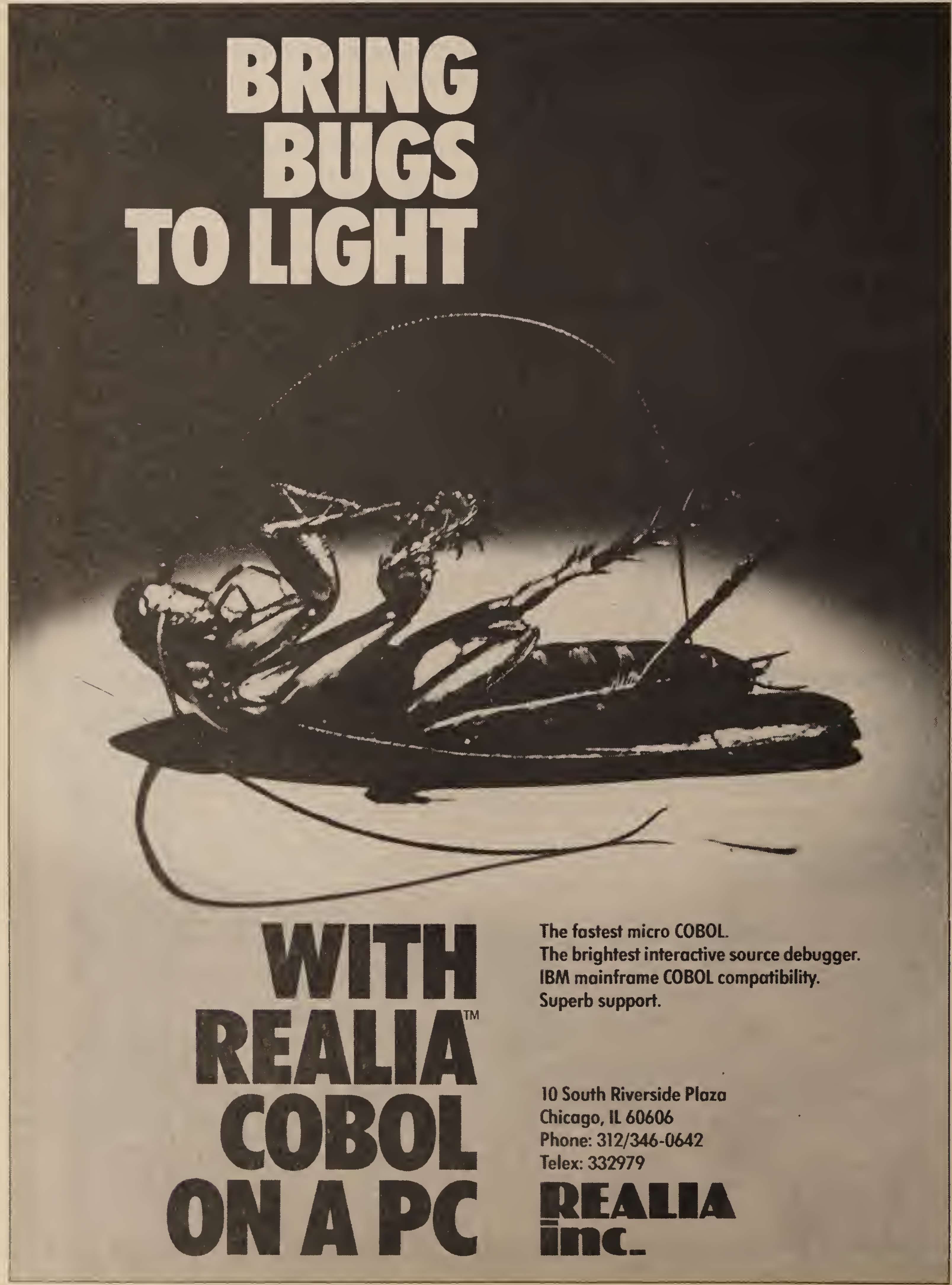
Information provided by Computer Intelligence Corp. interviews with managers in more than 11,000 U.S. computer sites.

Breaking out T1 installations by industry sector, the research firm finds that discrete manufacturing companies account for the largest number of T1 sites: 26% with currently installed T1 lines and 19% planning to install them. The next largest number of T1 sites are found in the medical and education sector, with 13% already using T1 and 14% planning installations, the report states.

Among banks and savings and loan companies, 11% have installed T1 links and 10% plan to do so.

The smallest number of T1 installations are to be found in the agricultural, mining and construction sector, with only 3% of interviewed sites currently using T1 links and 1% planning to do so.

The "rising availability and affordability of T1 carrier facilities" has also sparked the T1 multiplexer market, the report states. The "clear industry leader" for T1 multiplexers is Timeplex, Inc., with a 31% market share, according to Computer Intelligence.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NBI unwraps Disoss gateway

By Elisabeth Horwitt

BOULDER, Colo. — NBI, Inc. recently announced a gateway between its own computer systems and IBM's Distributed Office Support System (Disoss).

The gateway is a software package that resides on an NBI 570 departmental computer and works in conjunction with NBI's Oasys electronic mail system. The gateway supports peer-to-peer communications through PU2.0 and LU6.2 protocols, as well as IBM's document formatting protocols, Document Content Architecture. The product enables users to exchange information, including editable documents, directly with other systems on a Disoss network, according to NBI.

NBI's Disoss gateway functionality can be extended to IBM Personal Computers and compatibles via NBI Net, the vendor's 802.3-compatible local-area network. PCs on the network can exchange mail with an IBM Disoss network by using the gateway and the Oasys electronic mail system residing on the host. No additional PC software or nonstandard host software is necessary, according to NBI.

NBI's Disoss gateway costs $7,000 and will begin shipping by the end of the month, the company said. Oasys Mail, a prerequisite for the gateway, is currently priced at $7,500, with quantity discounts available.

Micom links LAN, PBX

From page 37

data PBXs connecting approximately one million terminals, "but their market has slowed down with the growth of PCs. That's where Interlan comes in," Young said.

While data PBXs are designed to handle RS-232 terminal connections of up to 19.2K bit/sec., PC users transferring large files need the 10M bit/sec. speeds of Micom-Interlan's Ethernet, he pointed out.

Plug-in controller

Also announced was the INTS32/MicroVMS, a plug-in controller that enables Microvaxes running VMS to communicate over an Interlan network using TCP/IP protocols. The controller supports up to 32 terminal ports.

It is priced at $3,000 and is available now.

A Xerox Network Systems (XNS) version of NTS100 is priced at $2,750 and is also currently available.

The same product equipped with Featurepak, an optional plug-in cartridge module for loading in software updates, is priced at $2,900.

A TCP version of NTS100, with the Featurepak option, is priced at $2,900 and will be available in February 1987.

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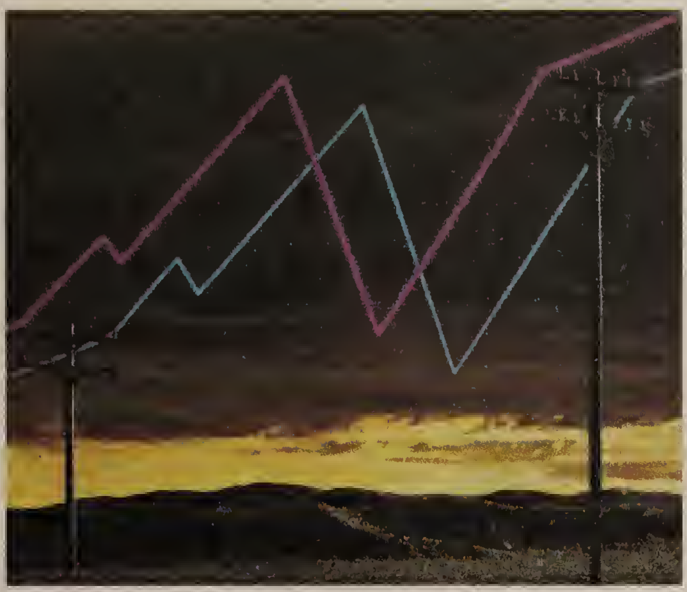

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Dictionary key to data access

From page 37

tain attributes from individual records.

- Sorting the data into optimal order for processing on a different machine using different software.
- Summarizing the data to the desired level. Why take out customer-level data if the report will be summarized by region?
- Subsetting the data so that only those records that meet the user's needs are moved down to the micro.

Interaction between a data dictionary and micro-to-mainframe software allows the user to perform all of the above functions on the mainframe, thus avoiding the need to download entire files on an overburdened PC.

A brief explanation of a data dictionary's functions might be useful. In earlier times, data dictionaries were used for functions like eliminating data redundancy and establishing common definitions for critical items of information throughout the firm and so on. James Martin and other theorists of data base management system (DBMS) architecture and utilization argued convincingly for data dictionary implementation.

The trend toward installation of noncentral processing sites has made the data dictionary an even more critical MIS tool. The decentralized processor may be a single PC generating a report or two, but the need for an adequate facility for describing and selecting the data remains.

Unfortunately, the absence of a generally accepted data dictionary standard has seriously hampered product development and acceptance. In addition to several proprietary data dictionary architectures, there are fourth-generation languages that can work with other vendors' software products through a data dictionary.

Information Builders, Inc.'s Focus, for example, can read numerous architectures. The vendor is currently working on a product that will enable users to maintain a central library of information about all corporate data.

However, the lack of a standardized data dictionary architecture makes it extremely difficult for third-party micro-to-mainframe vendors such as Lotus Development Corp. and Micro Tempus, Inc. to interface with multiple mainframe DBMS products. Lotus offers a different module of The Application Connection (TAC) for each data base architecture with which the software interfaces. Focus provides an interface that will allow TAC to directly read the masters without the need for redefinition.

This modular approach will actually work quite well for the majority of shops that only use two or three different interfaces. The problem is if the company decides to implement another micro-to-mainframe product besides TAC, the process must be repeated.

Where does that leave us? Desperately seeking standards. The one glimmer of hope predictably lies with IBM. According to Ted Goldstein, technical director for New York-based consulting firm Tangent International, the data dictionary used with IBM's DB2 relational DBMS "could be used as a standard definition for any purely relational file structures or individual flat files." As more companies install DB2 and its query language SQL, pressure is building for software vendors to support IBM's data dictionary.

Bubala says that he has had a number of requests to integrate Tempus Access with the dictionary. However, Micro Tempus has given no statement of direction on the issue. A growing number of mainframe software vendors, including Information Builders and ADR, have announced DB2 and SQL support.

Perhaps a standard is in the making — it would certainly be welcome.

Digital network management

From page 37

lines "wherever possible — they are less susceptible to interference from the environment — but we still use analog lines in a lot of places where digital lines are not available. Georgia is still very rural."

Until the advent of DDS secondary channel support, Bank South was using Racal-Milgo's Communications Management System (CMS) to troubleshoot analog lines but had no customer-controlled management system for digital lines.

Once the bank has implemented secondary channel support in its digital network, using Racal-Milgo equipment and Southern Bell's Synchronet service, "digital circuits will feed reports of alarms, performance and response times" into the same Racal-Milgo CMS system that monitors analog lines. "We'll be managing the whole network, not just half," Rambo said.

While secondary channel support is not available with any current long-distance digital data service, AT&T has for some time been ready to offer that capability with its DDS, according to company spokesman Jim Byrnes. "DDS is point-to-point, so we need that secondary channel support at the local termination area," he said.

Pacific Bell of Pacific Telesis Group and Bell Atlantic Corp. are among the other regional companies that have filed or plan to file for secondary channel support tariffs.

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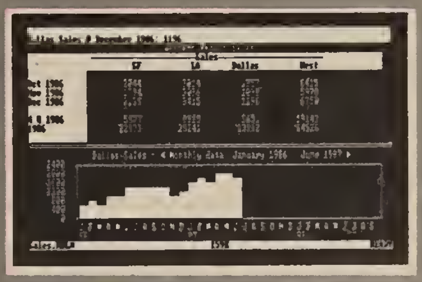

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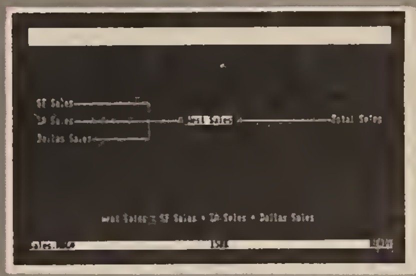

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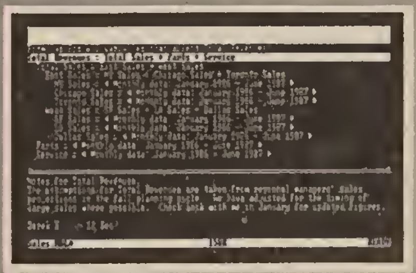

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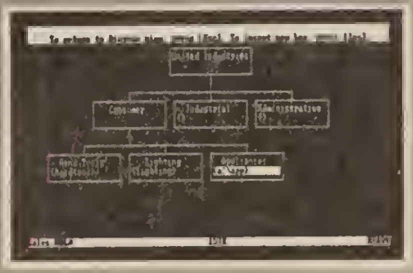

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MICROCOMPUTERS

MICRO BITS
William Zachmann

Excel-ent tool for the Mac

There may be no more devastatingly convincing way to dispel the myth that the Apple Computer, Inc. Macintosh is a toy computer than to introduce a power user of a popular IBM PC-DOS spreadsheet package to Microsoft Corp.'s $395 Excel for the Mac.

You might point out that the Macintosh Plus's 7.83-MHz Motorola, Inc. 68000 microprocessor, by operating with a 32-bit internal data bus, is a tad faster than the IBM Personal Computer AT. But as they told me back at Harvard Divinity school nearly 20 years ago, it is always best to speak to people according to their condition. And there is nothing a heavy-duty spreadsheet user can understand better than a better spreadsheet. It was the instant recognition of Lotus Development Corp. 1-2-3's superiority over Lotus's older package, Visicalc, that made 1-2-3 such a dominant winner that even Lotus's own Symphony has been unable to displace it.

Excel is instantly recognizable as a better mousetrap when compared with popular PC-DOS spreadsheet products. In the first place, it uses to good advantage the inherently easier to learn and easier to use standard Macintosh user interface.

For example, the mouse cursor control is very effectively used for selecting cells or groups of cells. Whether it is used to reformat cell contents, include cells in formulas, use them in graphs or move them around, you will find that

See **EXCEL-ENT** page 51

Zachmann is vice-president of research at International Data Corp.

Word processor ties to 1-2-3

Turner Hall package used Lotus Developers Toolkit

By Peggy Watt

CUPERTINO, Calif. — A word processing program that creates documents for integration with Lotus Development Corp.'s 1-2-3 spreadsheets is scheduled to be available in February from Turner Hall Publishing.

Turner Hall, a division of software developer Symantec Corp., will introduce 4Word, a $99.95 word processor, this week. The product is one of the first built utilizing Lotus's Developers Toolkit.

The add-in product is a limited word processor that takes advantage of 1-2-3 screen and printer drivers and other spreadsheet code so that 4Word itself requires 45K bytes of memory, according to Tom Byers, Turner Hall's general manager. The 1-2-3 user can call up 4Word in mid-document to insert text or cut and paste spreadsheet cells into text. Also, later changes in the spreadsheet figures are automatically relayed and changed in the document's copy.

"This is a utility, a companion to 1-2-3," Byers said. He hopes to appeal to veteran 1-2-3 users who stretch the capabilities of the spreadsheet and estimates 25% of those users already try to write short documents with 1-2-3.

To be immediately familar to 1-2-3 users, 4Word has many of the same function key commands and a similar command line and accepts 1-2-3 macros. It has basic word processing features such as word-wrap, text formatting and cursor movement control but bypasses more sophisticated features such as footnotes.

4Word is not intended to act as competition to Lotus's recently announced word processing program, Manuscript. "That is a separate, stand-alone product, solving a different need," Byers said of the Manuscript product. "4Word offers convenience and integration for people who use 1-2-3."

However, because of the tight integration with 1-2-3 code, 4Word is not compatible with 1-2-3 clones or with versions earlier than 1-2-3 Release 2.0, Byers said.

Industry analyst Jan Lewis, president of the Palo Alto Research Group in Palo Alto, Calif., and a regular 1-2-3 user, said, "[4Word is] a super product. People have been jumping through hoops to get num-

See **WORD** page 50

Emulator keeps host out of sight

By David Bright

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) has introduced an IBM 3270 software communications emulator that allows mainframe communications operations to run in the background while IBM Personal Computer programs run in the foreground.

"Our new product allows the user to more fully utilize the resources of the PC," said Stephen Chiu, NSA marketing vice-president.

"Background operations make the new emulator very convenient and efficient to use," Chiu said. "The PC user can initiate a file transfer from the host and then run another IBM PC-DOS program, such as Micropro International Corp.'s Wordstar, in order to do productive work while the data is being transferred in background mode to a PC disk file or being printed on the PC printer."

The $585 Advanced AdaptSNA 3270 emulator also includes a file transfer program, a PC-DOS hot key, multiple sessions capability, a printer spooling function and soft keys. The file transfer program allows the emulator to both download and upload files between the PC and the mainframe, according to the vendor.

With the multiple sessions feature, the PC user can toggle among as many as three concurrent host screen sessions as well as two printer sessions.

With the soft key feature, according to the company, users can select single keys to carry out often-used key sequences.

See **EMULATOR** page 54

INSIDE

Desktop publishing added to text-graphics integrator for IBM PC/**50**

NEW THIS WEEK

- Purvis Systems offers Pipenet store-and-forward electronic process transfer system
- For more on this and other new products, see pp. 101-130.

INSTANT ANALYSIS

"These products will allow us to present the best possible solutions for our customers."

— Warren Pillsbury, vice-president for Nynex Business Centers, commenting last week on the decision to include popular non-IBM products in retail centers acquired from IBM in July.

Project management packages replace big systems, pencils

Plantrac helps revamp aging transit system

By Douglas Barney

For one user, microcomputer-based project management software has replaced the need for mainframe-based project management. For another, the software has provided a welcome upgrade from an unwieldy pencil-and-paper system.

The New York City Transit Authority, which runs all of the buses and subways in New York City, is planning a massive multibillion dollar redevelopment effort with the help of 50 copies of Plantrac from Computerline, Inc. in Quincy, Mass., a micro-based package that has replaced the need for a mainframe-based system.

"We have a very old transit system here. We have structures that date back pre-1900. We have subway signal systems that are over 50 years old. We have bus depots that started life as horse barns — it is just an antiquated system," says Steve Manne, director of capital program operations for the transit authority in New York.

"We are in the beginning now of a massive capital rebuilding program. This year is the fifth year of the first five-year section of the program. It is not going to stop, but keep going through the year 2000," Manne says.

One option that Manne has ruled out is using a mainframe to track the wide variety of projects the transit authority is undertaking. "I am in a central location here in Brooklyn; both these project offices that manage all of these jobs are all over New York. Some of them are 20 to 30 miles from here," he says.

The multiple project locations made the use of a mainframe system impractical. "I saw no reason, nor did I even want to get involved with a mainframe project control type of system. If I was to use a centralized mainframe system here, I would now have communications from at least 30 users over telephone lines and have all the attendant problems," Manne says.

Cost saving is another reason to go with a micro solution. "I don't believe that you need to spend that kind of money for project control like we used to 10 years ago. I believe that what used to cost you a half a million, or $250,000, you can do for under $10,000 now," Manne says.

For Manne, the software is a major help. "For the first time in the history of the transit authority, it gives us a good handle on a schedule and a plan to get the work accomplished," he says. Another advantage for Manne is a greater knowledge of the tasks that contractors are undertaking. When there was change in a project, transit authority managers previously had to accept the contractor's version of how much extra the job would cost and how much longer the job would take, Manne said. "Now we know exactly how long it is going to take, within reason, to get the job completed.

"It has already allowed us to analyze one contractor's plans for prosecuting work and not accept it because

See **PACKAGES** page 50

Packages replace systems, pencils

From page 49

there was a better way to do it which would have shortened the schedule and saved us money," he says.

The most important aspect of the software is its ability to save money. "If you take a large project, if you can take 30 days off the schedule by decent planning, you already save the whole $100,000 you spent [on the products]," he says.

The U.S Postal Service is another user of micro-based project management. Using Software Publishing Corp.'s Harvard Total Project Management, Jim Campbell can predict with a high degree of accuracy when a project will be completed and what resources will be needed.

Before moving to a microcomputer, Campbell, a postal operations analyst in the operations planning division for the western region of the U.S. Postal Service, used charts created with paper and pencil. "I ran across the Harvard project manager inadvertently and thought, 'Baby, this is sweet,' " he says.

> *'I ran across the Harvard project manager and thought, "Baby, this is sweet." '*
>
> — Jim Campbell
> U.S. Postal Service

"What I am replacing is a list of jobs to be done with start and finish dates with no dependencies. That is in effect a nongraphic Gantt chart," Campbell says. "The most valuable thing I get out of it is a 'to do' list, which is a plain, simple checklist. The important thing is that anytime someone adds a task, or drops one or extends a time, it affects that list."

In addition to managing large numbers of tasks and creating guides to a project's progress, the software is fast, Campbell says. A change that used to take up to five days to incorporate into an overall plan now takes three seconds, he says.

Despite the benefits of current micro project management software, the best may be yet to come. "We are just now learning how to use these tools. We have just begun to scratch the surface," Manne says.

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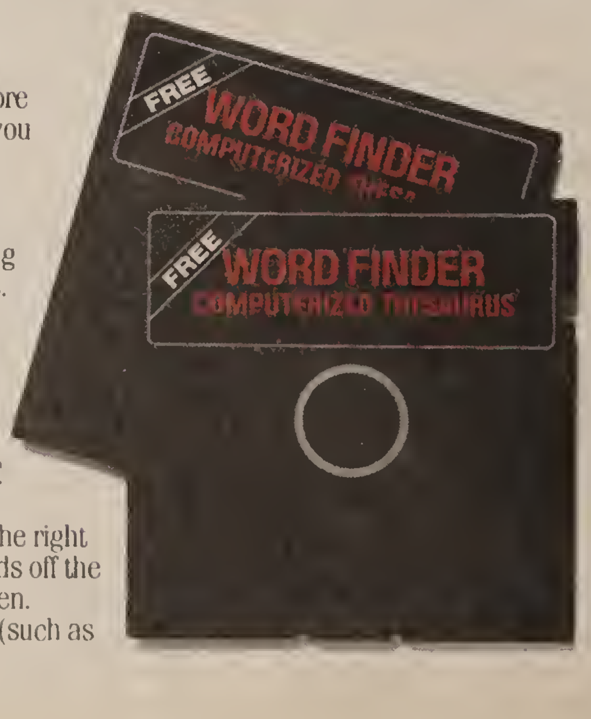

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Inset adds publishing tasks for PC

DANBURY, Conn. — American Programmers Guild Ltd. (APG) has added desktop publishing features to its Inset text and graphics integrator for the IBM Personal Computer.

The company claims that there are 100,000 installed copies of the original Inset program for capturing graphics created by one program and inserting them into a separate text file. A typical use for Inset 2, as well as Inset, is printing Lotus Development Corp. 1-2-3 or Symphony graphics inside the spreadsheets with which they were created.

The random-access memory-resident program runs with most major word processors and data base management and spreadsheet programs.

"The technology of graphics and text integration has truly come of age," said APG Marketing Vice-President Gary Skiba. "The new features that have been included in Inset 2 bring even more power and ease of use to graphics and text integration in word processors, data bases and spreadsheets."

Capabilities added to Inset 2 include a graphics editor, a preview function, variable sizing, graphics conversion and importation, optional mouse support, Help screens and a range of print options.

Previous versions of Inset were $149. Inset 2 will cost $99 through mid-February, when it may be adjusted according to the market.

The graphics editor for creating new graphics and customizing captured graphics can be called up at any time, the company said. Editing features include line, rectangle, circle and dot drawing; dot magnifications; and a choice of five text fonts.

Word processor ties to 1-2-3

From page 49

bers into documents. It not only takes a lot of time, but you have problems if you make changes." The piggyback onto 1-2-3 code is a clever solution, she said. "And it's at the right price point too."

Julie Bingham, Lotus manager of developer marketing, said she expects 4Word to be among the first of the add-in accessory products that will be more easily developed with help of Lotus's new $150 tool kit, scheduled for release by the end of the year.

"Add-in programs are actually assembler call routines that directly link the add-in to the core of Symphony or 1-2-3," she said. "You're able to tap into the functionality of those products, use them to handle some routines you otherwise might have to write."

Two earlier Turner Hall 1-2-3 utilities, the pop-up notepad Note-It and spreadsheet data-condensing SQZ, are random-access memory resident and are 4Word compatible.

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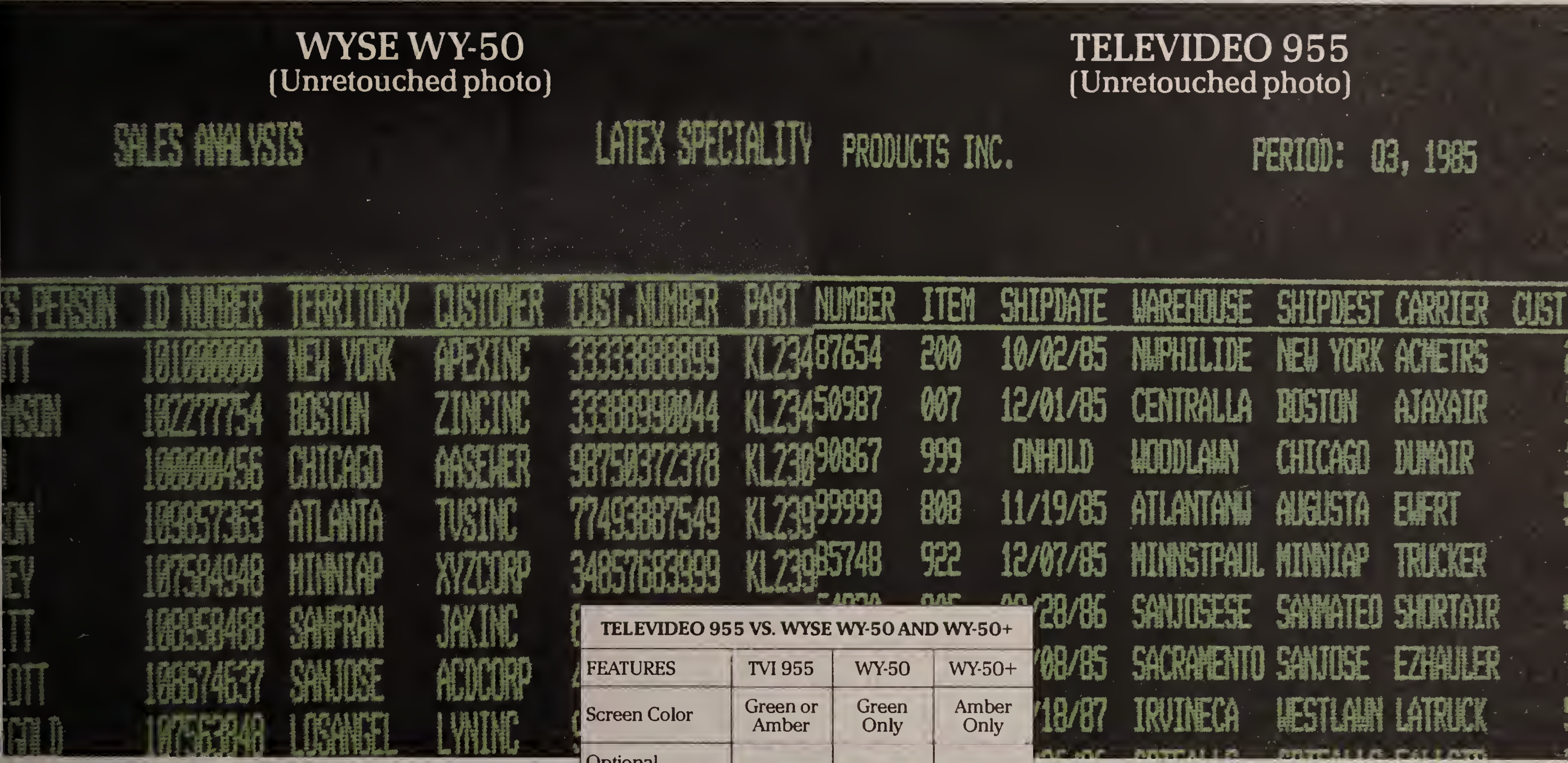

WYSE WY-50
(Unretouched photo)

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SALES ANALYSIS                LATEX SPECIALITY PRODUCTS INC.                PERIOD: 03, 1985

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Optional Graphics model	Yes	No	No
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Maximum non-volatile bytes per function key	256	4	64
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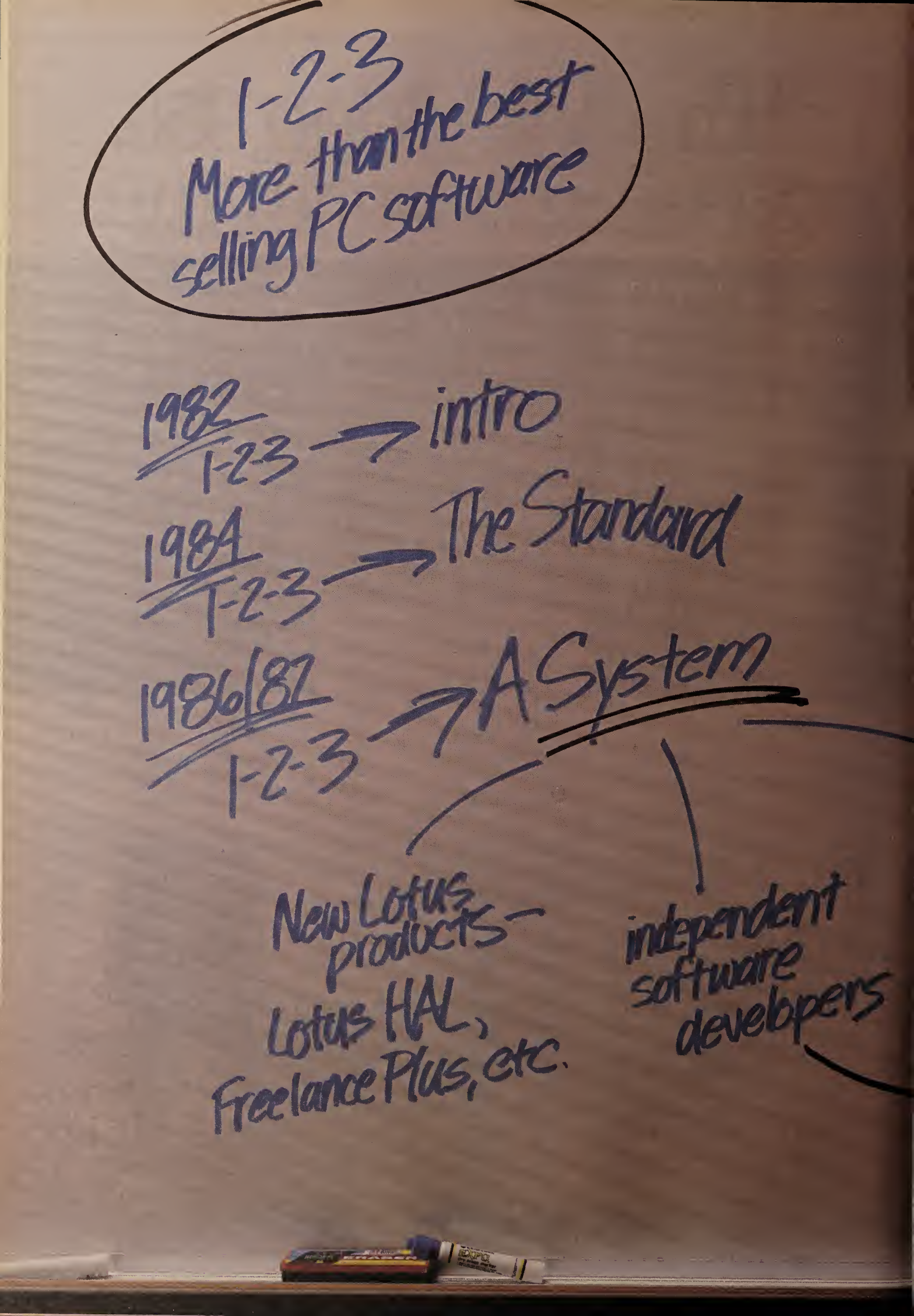

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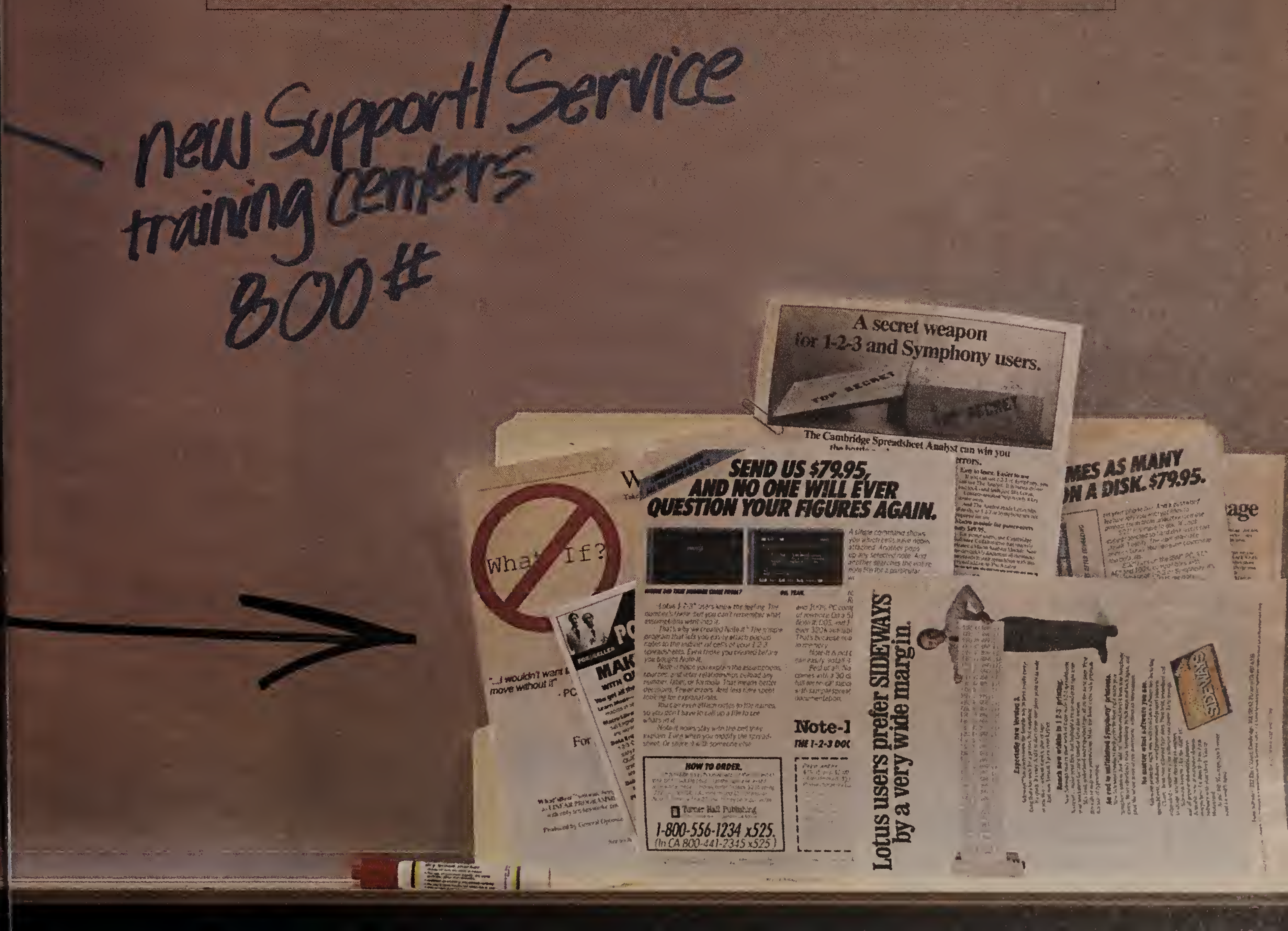
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Excel-ent tool for Mac

From page 49

once you get used to the mouse, conventional cursor key methods will seem obsolete and inconvenient. After only a couple of weeks using Excel on the Mac, I already find myself pathetically groping for the missing mouse when using my favorite spreadsheet package on my IBM system.

Of course, another capability that simply comes with the Macintosh territory is the ability to create output with different fonts and font sizes. This is possible in ordinary spreadsheet printouts as well as in graphs and the like. Used in combination with other programs on the Mac, Excel output can easily be included in reports or other documents.

The advantages of Excel go far beyond those that come from being a well-designed Macintosh program, however. A powerful spreadsheet program with equally powerful data base and charting (or graphics) capabilities, it offers substantial improvements over comparable PC-DOS programs in all three areas.

Consider just a few examples. Excel includes a facility for creating a table that can show the values of a formula created for a series of values for one or two variables. To create an interest amortization table for different principal amounts and interest rates is a simple operation in Excel. Another useful spreadsheet feature is the ability to create a series of dates or numbers with a single command sequence.

Some other handy features include facilities for handling iterative (circular reference) calculations, linking multiple spreadsheets and naming objects within the spreadsheet. The latter capability not only makes it possible to make formulas easier to understand but provides a means of symbolically binding references with data values. This greatly enhances the freedom with which spreadsheets may be rearranged as well as linked to each other.

With selection criteria specified in a manner similar to IBM's Query by Example or Ansa Software Co.'s Paradox, Excel provides a quite powerful relational data base capability. While I probably wouldn't use the product for large-scale data base applications, Excel nevertheless offers powerful data base capabilities that compare favorably with dedicated data base programs.

Some of the most appealing advantages of Excel are to be found in its graphics. A very handy scheme using galleries of chart formats in which you simply point to the type of chart you want puts an enormous selection of chart types at the user's disposal. In addition, Excel includes a spectacular array of functions and a powerful macro facility. The macro facility is, in effect, a very powerful programming language in its own right.

In an interview published in the November 1985 edition of *MacWorld*, Microsoft Chairman Bill Gates said, "The Mac has been viewed as a wimp's machine. It's so easy to use, so people immediately get the idea that there must be some tradeoffs. We've got to break this false impression that this machine has some lack of power, that ease of use equals simple. And Excel will go farther to break that than anything."

Just a little more than a year later I couldn't put it any better. Excel is serious business software that proves the Macintosh provides a platform on which you can do anything you can do with the IBM PC standard — and more.

Project Management Feedback...

"We frequently have a dozen or more active projects. Upper management has a penchant for changing their priorities on a regular, but unpredictable basis. The projects draw from a common resource pool. We need a project planner that recognizes the priorities and assigns resources accordingly."

"Some of our users need a sophisticated project management tool, others need only the basics: PERT, Gantt, and summary reports. There should be an easy to use software tool which satisfies a broad base of users."

"Our projects are substantial. A single project can be five years or more in duration. For manageability, we prefer to divide our projects into phases. We need a separate critical path for each phase, and we love to see cost and time data by phase."

"Help! We've got some resources working part-time, others full-time, and a few can even work overtime. Project managment software should allow for variable work week schedules among resources. Although we don't normally assign overtime, it would be nice to use it selectively, perhaps on critical activities only."

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Emulator talks to host

From page 49

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Product Spotlight

Edited by Barbara Wierzbicki

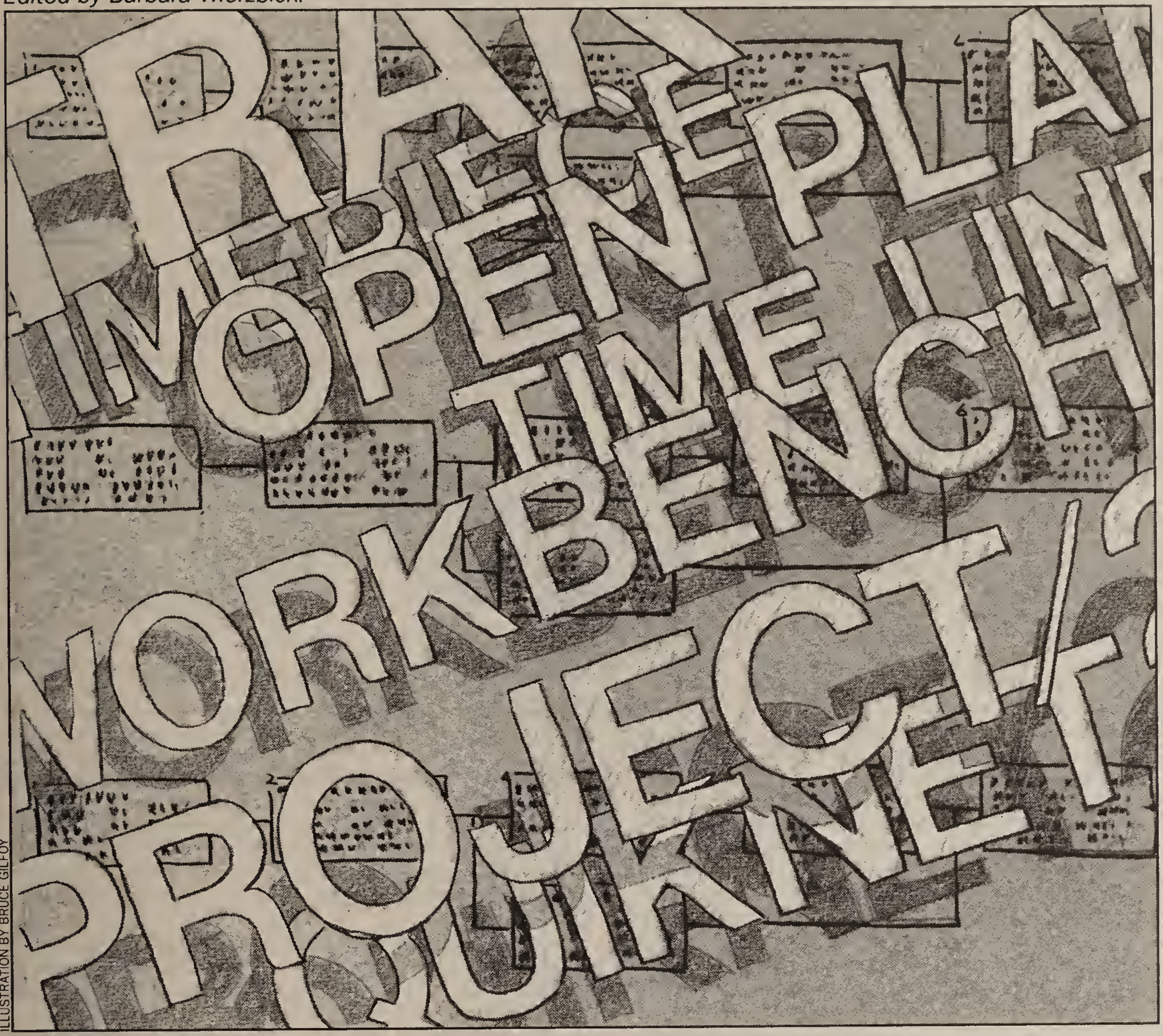

ILLUSTRATION BY BRUCE GILFOY

INSIDE

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Training for the art of project management: Understanding the language and fundamentals behind the information*/64*

Comprehensive chart of project management software*/66-69*

Project management software

PCs taking over from mainframes

By MICKEY WILLIAMSON

Project management software finds a receptive audience across a broad spectrum of business and industry — from software development and DP/MIS to engineering, manufacturing, construction and massive public undertakings such as this year's July fourth Liberty Weekend and the 1988 Winter Olympics.

Sales are brisk. International Data Corp., a Framingham, Mass.-based market research firm, predicts that sales of personal computer-based packages alone will grow by an average yearly rate of 40%, reaching $235 million worth of products shipped in 1990 — a prediction that says something about the benefits users expect to derive from this software.

Initially used for large-scale military systems, the terminology and techniques of project management are more than 30 years old. To date, project management software simply automates traditional ways of charting project tasks with techniques such as CPM and PERT. It does not address subjects such as quality control, employee motivation or any of the other abstract issues with which a human manager must grapple.

Nor does use of a project management package ensure that the manager has thought of everything that should be included in the plan, although diagraming the relationships among project activities is often a great aid in checking for forgotten steps.

Future generations of this software will surely embody the kind of intelligence required to handle some of the more abstract functions of project management. Surely by 1990, we should see systems that learn from previous projects and grow in capability as they are used.

Despite its current limitations, project management software enjoys widespread industry use, running on computers of every size and capacity.

Project management software, worthwhile and capable as it is, is no miracle worker. Interpretation of results and intelligent decision making remain in the province of management, not the computer.

Mainframe and minicomputer systems can range in price from $15,000 to $75,000. More than 100 project management packages for personal computers have come to market in the past two years, priced from less than $100 to $5,000 or more.

The level of complexity at which a manager can

Williamson, a technical journalist based in Warwick, Mass., is also a partner in the Qwerty Group, a firm specializing in software development and artificial intelligence consulting.

Project software — PCs overtaking mainframes

Continued from previous page

justify an investment in computerized project management varies according to the nature of the project. In general, any undertaking that involves more than two people and a few dozen tasks represents a likely candidate for project management software. Looked at another way, where an inflexible budget or demanding schedule is part of the picture, tracking the project with a software package may be the key to success.

Chief among the rewards of computerized project managers is the ability to juggle a multitude of details whose relationships with each other constantly change. A potent productivity aid, project management software can do the following:

- Perform repetitive calculations that consume much of a manager's time and energy.
- Prevent scheduling conflicts and make optimum use of available resources.
- Draw charts and networks to represent the project schedule and sequence of activities.
- Track actual progress and expenses compared with initial estimates.

Along with mastery over a project's manifold details, these packages can yield an added benefit. Their graphics and report facilities provide a means for enhanced communications between the project manager and the client organization, building a better understanding of the project and confidence in the way it is being managed.

Project management software can feature so many different capabilities that choosing a package with the right combination of attributes can be a major project in itself. At Pacific Gas & Electric Co. in San Francisco, Brian Pace, project management analyst, looked at some 70 products before his firm selected Project Software & Development, Inc.'s Qwiknet for 1,000 personal computers running under Microsoft Corp. MS-DOS. The program's ability to customize reports was a deciding factor.

Even though PC-based packages typically offer less functionality than those running on minicomputers and mainframes, many project managers prefer to use microcomputers because of their computational speed. Sue Seraichick, senior programmer analyst for Yankee Publishing Co. in Dublin, N.H., is project leader in a yearlong effort to port Yankee's advertising management system from a Nixdorf Computer Corp. 600/55 system to an IBM System/38. She set up the project team's schedule using Microsoft's Project. Eventually, she found the software inadequate for day-to-day tracking but said she still believes that personal computers are uniquely well suited to project management.

"This is the kind of thing that should really be on the PC because of response time," Seraichick said. "I can just see trying to recalculate a large network of project tasks on the System/38. You could just go home and wait for it to finish. Heavy-duty math is not one of the 38's stronger points."

With their greater ability to do rapid calculations, personal computers encourage managers to explore options. By contrast, mainframe systems are commonly geared toward batch processing. One- or two-day turnaround times are inimical to on-the-fly analysis. Additionally, managers need to know instantly when a schedule begins to slip; a two-day wait may mean serious trouble.

On the other hand, many PC-based systems have their own weaknesses. They typically accommodate shorter projects and fewer tasks and have a limited ability to show relationships among tasks. Compared with large systems, they may be relatively inflexible in the options available for describing the project and in the kinds of reports they produce.

The ideal solution for large projects is to link personal computers to mainframes in a manner that allows downloading of individual tasks or subprojects for monitoring or analysis. Providing this capability is a primary strategy for large system vendors such as Project Software & Development, whose Quiknet software runs on PCs that can be linked to the company's Project/2 software on a mainframe. Multisystems, Inc. provides functionally identical microcomputer, minicomputer and mainframe versions of Multitrak that can be linked into a single integrated system.

In selecting a system, have in mind a specific project, preferably one that typically represents projects for which the software will be used in the future. Fixed corporate constraints should be considered first: Must the software run on existing hardware? Under a specific operating system? What is the budget for software acquisition and training? Does the application require networking and multiuser capabilities? Must the system be able to communicate with the corporate data base? If so, what data formats and communication protocols are involved? Moreover, an intelligent acquisition process takes into account characteristics of the project to be managed and the organization's report requirements.

Software packages vary widely in their capacities to digest project data. A project is made up of its tasks or activities and the resources — employees, equipment, materials and money — used to do the work. A project may consist of only a few or tens of thousands of separate activities, be carried out by a couple or by many hundreds of people and cost a few thousand or many millions of dollars. It is important to have a clear sense of the upper bounds of each of these factors in relation to the largest project the software is likely to handle.

A system such as Primavera Systems, Inc.'s Primavera Project Planner will handle 10,000 activities; Open Plan from Welcom Software Technology can accommodate 32,750 activities. Other packages overcome more severe capacity limits by dividing a project into subprojects that may be linked for charting and reporting purposes.

Breaking down a project into subprojects may in fact be an advantage, allowing several people at one time to enter project data in a networked system. Moreover, it is likely to improve recalculation speed in large systems.

But there are dangers inherent in merging subprojects, as Seraichick learned when she divided her 77-task software project into smaller components. Because she had used the same activity name in several subprojects, when she merged them into a report to the project steering committee, the software ignored tasks with duplicate names. To her chagrin, her report on the status of 77 activities listed only 73 — the data for the other four had been erased from the system.

Seraichick's reason for breaking her project into smaller segments points out another potential pitfall of small system limitations. Although hers was a small project in terms of activities, one task had 15 predecessors. The version of Microsoft Project that Seraichick used could only handle 14

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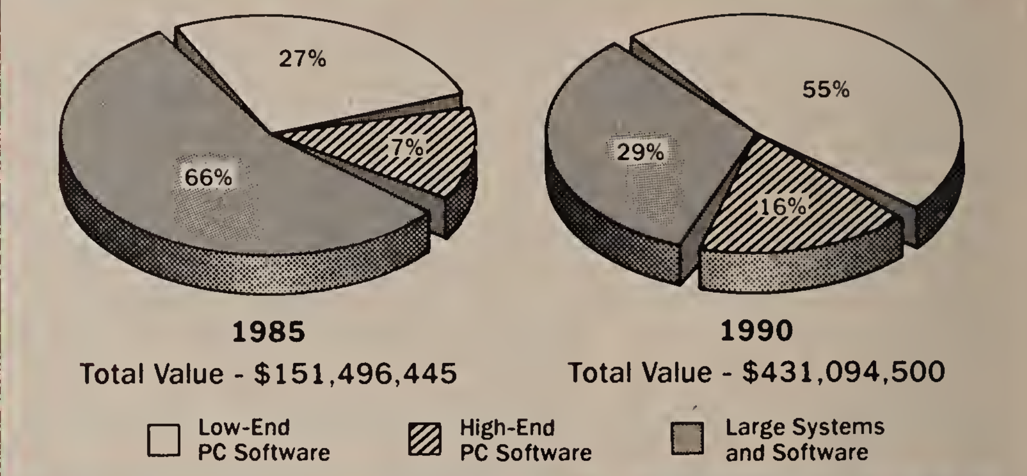
JEFF BABINEAU

PROJECT MANAGEMENT SYSTEMS AND SOFTWARE MARKET SHARE 1985 and 1990



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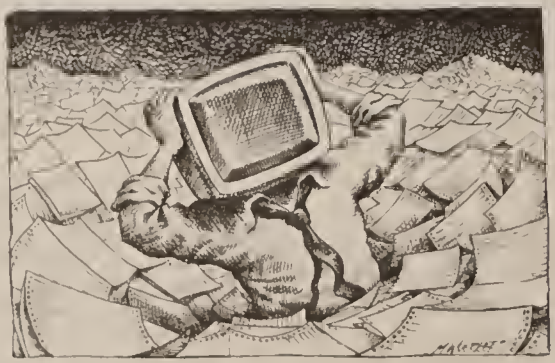

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Four years into the project, organizers of the 1988 Winter Olympics in Calgary, Alta., have so far identified more than 5,000 separate activities and are still counting.

Activities of the Olympiques Calgary Olympics 1988 (OCO '88), the official organizing committee, involve a staff of 300 and 7,000 volunteers.

There are a mountain and ski resorts to be built and 100 kilometers of cross-country ski trails to be constructed. A bobsled and luge track, the world's first indoor speed-skating rink and a 17,000-seat hockey arena must be built.

There are renovations to be made at the University of Calgary as well as improvements to roads, interchanges and the Calgary International Airport. Provisions must be made for the transportation, nourishment and safety of 1.3 million spectators and 2,600 athletes and officials. The committee's internal budget is $450 million.

For John Rickards, supervisor of scheduling for OCO '88, the need for management software was clear from the program's start in December 1982. "We knew that we would have vast changes and growth in this project. We knew that we couldn't do it on a manual basis," Rickards says.

"We felt that we needed a mainframe application because of the power involved," he adds. "In the initial stages, we had very little idea of how many activities might be involved. We wanted something that would handle a vast number of activities in multiple projects that could be separated or combined as need be. We wanted flexible reporting features and reliability.

"Dollar-wise, it's a small project compared to some I've worked on, but it's uniquely complex," Rickards continues. "A couple of thousand tasks have been completed, and we expect to identify a great number more before things are all over."

To keep the massive project on track and on budget, the organizers use an Amdahl Corp. mainframe running Project/2 from Project Software & Development, Inc. and its micro-based subset, Qwiknet.

Rickards began with a standard project management technique, the Work Breakdown Structure approach.

"The first thing we did was to list the facilities that had to be built. We looked at each one as a separate entity and broke it down into its component parts — including the buildings at each site and what is in each building room by room. Once that is done, you can start to schedule what you need to do," Rickards says.

Rickards says he chose to treat the Winter Olympics as an assembly of subprojects that individual planners could deal with separately but that could be drawn together when necessary. "We thought it was quite important to assess them individually but be able to pull them all together and look at the whole picture. This [requirement] cut down the number of systems we could use," he adds.

> ***'In nine months we were able to analyze the networks and bring the project up nine weeks. The net saving for the company totaled an average of $400,000 a day for each of those nine weeks.'***
>
> — John Rickards
> Olympiques Calgary Olympics 1988

Another important feature was the ability to assign codes to tasks within subprojects, these codes to be used in sorting data for reporting and analysis. "We needed quite a variety of possibilities in coding; Project/2 has a vast number of coding fields that we've used for everything," Rickards says.

Of Qwiknet he comments, "We've used it to some extent, but not as much as I had thought we would at the beginning — mainly for building prototypes and planning short-term projects where there are a limited number of activities and it's not necessary to interface with another part of the project."

Integrating Qwiknet with Project/2, it turned out, was easy enough for people with prior experience in project management, but they are a small minority at OCO '88. Rickards explains, "The people we have here are all professionals in their own field, but very few of them have had exposure to project management. Those that had some appreciation for project management techniques were able to pick up the package very easily. We sat down with them for a half hour or so, and they were up and running with it."

Rickards says he was also looking for a great deal of flexibility in designing report formats. Project/2 met the requirement, but Qwiknet, although it provides a good number of standard reports, was not sufficiently adaptable.

According to Rickards, companies cannot always cost-justify the acquisition of project management software in terms of payback. "I've done major projects with no computer systems at all, and when I say major, I'm talking about the $2 billion range," he says.

One such project was a four-unit nuclear power plant in Ontario. "That plant had been built before; there were few design changes. It was very much a routine project, if a nuclear plant can be called routine," Rickards says.

But another nuclear power plant in Wosung, South Korea, experienced a 26-week delay because of a lack of steel. Rickards' assignment was "to bring the thing back on schedule — or as close as possible."

Using Projacs, an IBM mainframe project manager, "In nine months we were able to analyze the networks and bring the project up nine weeks, averaging a week per month. The net saving for the company totaled an average of $400,000 a day for each of those nine weeks.

"The software's ability to calculate what we needed certainly assisted in the savings," Rickards says. "But if everything had been routine, there would have been no advantage to having had it. It really depends on the complexity."

— **Mickey Williamson**

Continued from page 56

predecessors to an activity and crashed when the limit was exceeded.

Seraichick, who was using a personal computer for the first time, initially thought the machine was simply slow at processing the information and waited for hours before deciding to restart the computer. Time spent keying in the list of tasks and accompanying data was lost.

The moral of this story is evaluate not only the number of activities and events a prospective project management system can accommodate, but also consider the number of dependent activities and the system's capacity to list and schedule people and other resources. The project's duration may need to be matched to the software's calendar limits, too.

The system's flexibility in modeling a project is an important consideration with many facets. Because it deals with schedules, dates and time lines, project management software includes a calendar that is adapted to the organization's schedule of holidays, regular work days and hours per day. There must be a way to make changes as needed during the project lifetime and to schedule individual workers' vacations and days off.

Some systems allow multiple calendars for a single project — useful where different departments follow different work rules or where some of the work is being done by organizations in different states or countries that observe different holidays.

Most project management packages develop the project schedule by working forward in time from a specified starting date. In some projects — political campaigns and magazine articles, for example — the one inflexible factor is the deadline, and scheduling must be done by figuring backwards from that date. Not every system offers that option, and the question of target-date scheduling may be the most important one the buyer asks. Among those that allow deadline-constrained scheduling are Project Workbench, from Applied Business Technology Corp., and Artemis, from Metier Management Systems, Inc.

Representing a project in graphic or chart form is a great aid to

Continued on page 60

"Thirty minutes 'til the meeting and we've got changes?"

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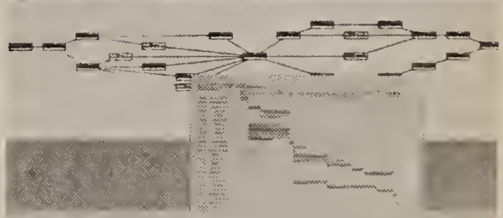

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Continued from page 57

understanding its scope and monitoring its progress. Project management software excels at producing these charts from input data. Since the late 1950s, two main categories of charts have formed the backbone of project management procedure.

One way project managers track progress is with a Project Evaluation and Review Technique (PERT) chart. Developed in the late 1950s, PERT's first major achievement was in bringing the U.S. Navy's Polaris submarine development effort in on time and under budget.

The PERT chart depicts activities and events in relation to each other. Using boxes, arrows and connecting lines, the PERT chart makes clear the links between predecessor and successor tasks, showing the logic of the project plan and facilitating identification of faulty reasoning.

Useful as it is, however, the traditional PERT chart has a serious deficiency: it does not depict time. So while PERT makes the chain of events clear, the user who relies solely on this type of project representation is left with no way to judge how the project is progressing in relation to its deadlines.

Gantt charts fill this void. Named for its inventor, Henry Gantt, a Gantt chart is a sort of bar graph. Each activity is a bar whose length is determined by the time required for its completion. A Gantt chart shows the schedule clearly, making it easy to know whether the project is on schedule. But the user who relies solely on Gantt charts has no clear way of knowing what the next activity is in a series of complex interdependencies.

Because both charts are aids to conceptualization, the nature of the project and the manager's own preferences will determine which is more useful. Sometimes one may be used to the exclusion of the other, but it is probably short-sighted to choose a package incapable of producing both PERT and Gantt charts.

Another valuable tool in the project manager's kit is the Critical Path Method (CPM). In most projects, some tasks can be completed at any point; other tasks cannot be delayed without delaying the entire project. These latter activities are said to be on the critical path. Project management with CPM capabilities analyzes the network of predecessor and successor activities and highlights graphically the connections between those on the critical path.

If the deadline for one critical activity slips, other affected deadlines will be easy to spot. Microsoft's Project and Timepiece from Communication Dynamics, Inc., are two systems that automatically calculate the critical path regardless of the order in which activities have been listed. The manager need only indicate which must be completed first.

Many project management systems can superimpose the critical path on both Gantt and PERT charts, whch is a real convenience. Another feature of packages such as Time Line from Breakthrough Software Corp. is the ability to produce a PERT chart against a time scale, overcoming PERT's major shortcoming. But this kind of representation, sometimes known as a time-scaled logic network, can be cluttered and difficult to read; it will probably not be the only graphic depiction on which the user will depend.

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> ***A project may consist of only a few or tens of thousands of separate activities, be carried out by a couple or by many hundreds of people and cost a few thousand or many millions of dollars.***

In addition to planning the number and sequence of project activities, basic project management tasks include determining the resources needed to do the work, scheduling them and calculating their cost. The project manager may want to schedule people by name, while at other times, human resources will be listed by job title or trade. A software system should be flexible enough to handle both methods. The system should also be able to schedule machinery and equipment, raw materials, supplies and component parts. Costing options, such as deducting the cost of reimbursable expenses, are a feature of systems such as Trak from The Bridge, Inc., and Primavera Systems, Inc.'s Project Planner.

Scheduling people and equipment can be tricky, especially with systems that do not recognize units of less than one day. Open Plan from Welcom Software Technology and Finest Hour from Primavera Systems allow the scheduling of resources in units of time as small as one minute. Harvard Total Project Manager from Software Publishing Corp. can schedule resources in minutes as well as in terms of a year or more.

But handling small units of time is not enough in many cases. Some systems, such as Microsoft's Project, that allow the scheduling of a resource for a fraction of a day or a fraction of an hour still consider that day or hour to have been completely booked and will not accept an additional assignment for the same resource during that period.

Unless the software offers flexibility in describing the relationship among tasks, the indication of

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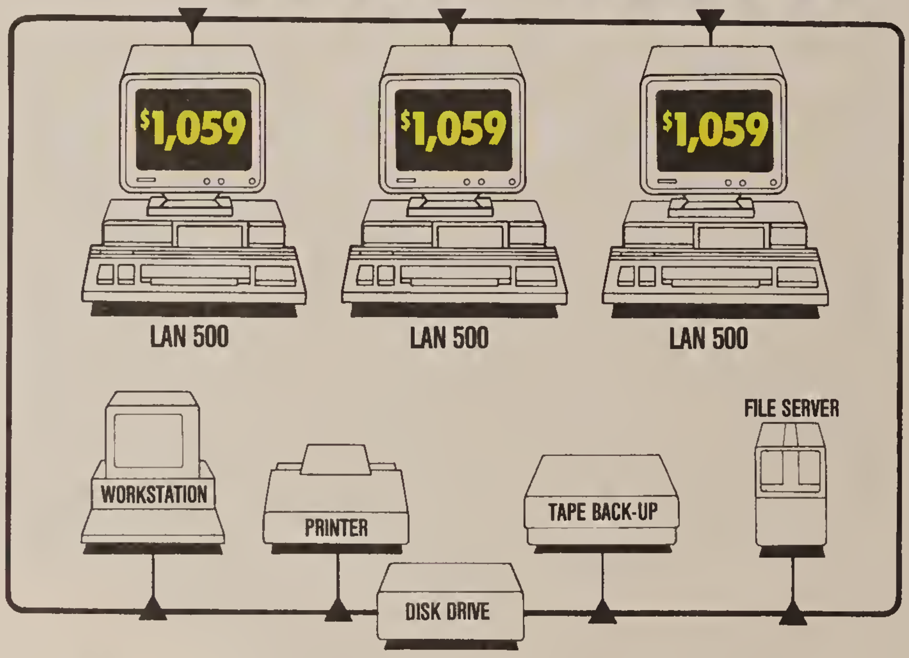

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dependencies can get in the way of resource scheduling, as well. Some packages show task dependencies only in terms of a finish-to-start or start-to-finish relationship. That is, if Tasks 1, 2, 3 and 4 are predecessors to Task 5, then the first four activities must be finished before the fifth can start, and no resources can be allocated to Task 5 until the completion of its predecessors.

More flexible systems, such as Welcom's Open Plan and Multisystem's Multitrak, recognize other kinds of dependent relationships, such as start to start, which means that both must start at the same time, and finish to finish, indicating that both must be completed simultaneously even though they start at different times.

In scheduling resources, a capable software system will — at a minimum — flag conflicts and prevent a resource from being scheduled to do two things at one time. Systems such as Vue from National Information Systems, Inc. automatically resolve conflicts by rescheduling noncritical activities, leaving deadlines unchanged while redistributing resources evenly over the project life.

Sometimes the nature of the project is such that the manager wants the software for planning and scheduling only; tracking the project's progress will be done in some other way. More often, however, comparing projections to actual performance is required.

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> ***Analysis of an organization's data interchange and communications requirements, both now and in the short-term future, is an important part of choosing a project management software system.***

For Seraichick, leader of Yankee Publishing's first software development project on the IBM System/38, the purpose of using project management software was to develop benchmarks for planning future projects. In such a case, the ability to compare and report on estimates vs. actual data is a necessity.

Systems also vary in their abilities to adapt to mid-project changes. Some require changing the original baseline schedule. In such a case, unless a copy of the original plan has first been saved, important historical data may be lost.

If the critical path is important, the system should be able to recalculate the critical path at any time in the project if new task dependencies come to light. On-request recalculation of schedule dates from a given point in the project based on actual dates is a useful feature.

Perhaps no area in project management is as subject to individual variation as that of report generation. Companies have their established reporting procedures, and the best packages are sufficiently flexible to produce reports the way management wants to see them.

Among those most often wanted are a schedule of resources by day (estimated vs. actual progress and cost of discrete project tasks, as a function of the individual or department responsible) and detail and summary reports for each resource and activity.

Progress reports may indicate percentage of completion, resources expended, resources remaining or a combination of these. A few packages can perform detailed statistical analysis; some use standard ratios while others allow the user to define the ratios to be analyzed.

Several departments of the U.S. government have their own reporting standards and formats. Packages such as Project Alert from Computer Resources, geared to meet U.S. Department of Defense requirements, can yield major cost savings for federal contractors.

Producing summary reports for top management without getting bogged down in details is an important factor in any project management effort. A technique known as hammocking, found in products such as Multitrak from Multisystems, and Vue from National Information Systems, lets a manager look at the overall project in terms of the status of one phase, narrowing the focus to what is important at the moment and stripping away unnecessary detail.

Graphics capabilities and the output devices a package supports come into play especially in regard to reports delivered to high levels of management. Presentation-quality graphics may be desirable. A time-scaled logic network, showing the project's critical and actual paths vs. estimated performance will certainly be more comprehensible if produced in color on a plotter.

Communication Dynamics, Inc., a graphics software house, has equipped its product, Timepiece, to support more than 70 output devices including matrix printers, plotters, film recorders and slide-making equipment.

Analysis of an organization's data interchange and communications requirements, both now and in the short-term future, is an important part of choosing a project management software system. Ideally, a project management system will not

Continued on page 65

Demand for corporate information services is expected to grow dramatically over the next decade. With many data centers already running 24 hours a day, *managing* this constantly increasing workload may become a bigger problem than doing the work itself.

But a large part of that challenge can now be met by simply moving up to real-time job scheduling, with ADC2, Automated Data Center software. Designed for an MVS or MVS/XA operating system, ADC2 software automatically builds and submits schedules. Jobs are automatically released as predecessor conditions are met. With ADC2 software, all jobs are monitored as they run, providing real-time job and system performance statistics. This current and historical job status information is immediately available to the operator, scheduler or data center manager for decision making.

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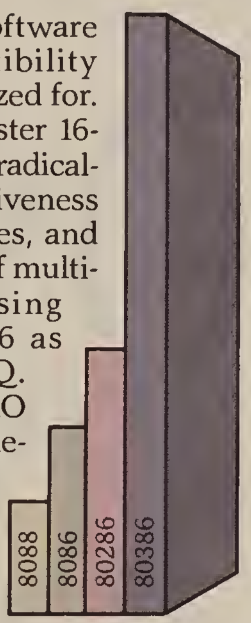

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Training for the art of project management

By MARK BURGESS

There is a story of a sidewalk and a beleaguered construction foreman whose troubles begin with an unpleasant meeting between the vice-president and his project manager. The project is behind schedule, and the vice-president wants it back on track by the end of the month. Smarting from the vice-president's verbal lashing, the project manager finds our foreman and wins him over to the cause. The foreman charges ahead, looking for ways to get back on schedule.

He finds everything he needs to pour the sidewalk around the building — including the manpower. So he hustles around for a few days getting the walk finished. He finds a few other tasks and pushes his people to complete those. Later, the project manager comes out for a walk of the job, finds it still behind schedule and chews out the foreman in his frustration.

Who is at fault? The vice-president for arbitrarily setting the deadline? The project manager for not giving effective direction? Surely not the foreman. He worked so hard.

All three gentlemen in the above scenario need to develop the skill of critical-path scheduling. Finishing the sidewalk was a nice gesture but was not on the critical path. Working hard is not enough. Telling someone to work harder is not enough. A well-utilized and well-understood scheduling system will help you work smarter.

Enter training. Don't run away at the mention of the word. We both know about the bad press given to software that requires a lot of training. But what happens when the training takes very little time?

What happens when there are special Help systems and tutorials, menus that replace command input, good documentation — and still success remains out of reach? Now we are talking about the need for concept training vs. software training.

Take this test: Write down the definition of a critical-task path. Write down the characteristic(s) that put a task on the critical path in a schedule. The answer is remarkably simple: A task is on the critical path when any delay in completion of that task will delay the entire project. Almost every project management package is written around that precept. This rigor in defining tasks is one of the cornerstones of a good project schedule.

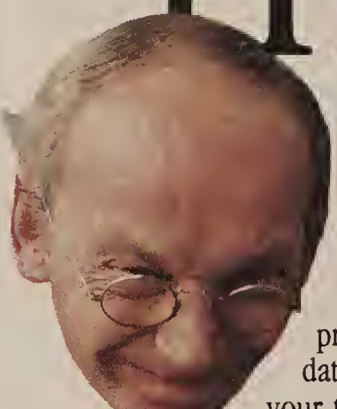
With a good scheduling system, you construct a model of the project. That model allows you to test possible solutions to problems. It takes the data from a job — perhaps a basic schedule generated and proven on another job — and helps build an accurate model.

In the case of the sidewalk, the project manager would have been discussing which critical task could be accelerated in order to get back on schedule. The foreman and the manager could have sat with the computer and found a way to make up the schedule in an organized and well-planned manner.

Recently, a government group found itself faced with delay damage claims from contractors based on micro-based critical-path systems. Like much of the country, the group decided it was time to learn about this powerful tool and the skills needed to use it.

The need for training should not frighten anyone away from project software, because no amount of good software, careful planning and conscientious updating will help the user make more money or be more successful until all project participants understand the language and the fundamentals behind the information. ■

Burgess works for Professional Applications Corp. in San Diego, Calif., sponsors of the Center for Project Management.



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Electrohome's sophisticated auto-lock feature was designed to eliminate concerns about compatibility between the projection system and your existing computer hardware. As a result, the instant it's turned on, the ECP 2000 locks-up to virtually all computer terminals or PCs. It's perfect if you have a variety of computer/video equipment. Best of all, it doesn't require an experienced technician to set-up.

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The ECP 2000's ease of operation makes it the perfect system for both fixed and portable applications. (For easy portability, a smooth-rolling, wheeled cart is available.)

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But the best way to get The Picture is to see the ECP 2000 for yourself. For more eye-opening information on the ECP 2000 color system, the ECP CAD/CAM, or the EDP-58 XL monochrome system, send your business card to: Electrohome Limited, Advertising Department, P.O. Box 628, Buffalo, New York, 14225-0628.

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Continued from page 61

function in isolation but will be part of the whole corporate information network, able to converse with data base and spreadsheet systems.

Packages differ in their abilities to share data and telecommunicate. Open Plan from Welcom Software Technology features a built-in interface to Ashton-Tate's Dbase III Plus; Intrac, from Intrac Management Systems, provides an optional link to ASCII and IBM's Data Interchange Format protocol files that can allow access to the corporate data base, accounting and word processing systems.

Project Workbench from Applied Business Technology offers as one of its options communications software for micro-to-micro and micro-to-mainframe operation in upload and download as well as transaction processing mode.

The more varied their capabilities, the more difficult project management packages can be to learn to use. Money spent on user training will probably be a wise investment.

In the process of evaluating software, the buyer should inquire about the availability of disk-based tutorials, individual and group training and whether classes can be delivered in-house — a significant cost saver for large user organizations.

Mainframe systems may be geared to more complex applications; however, such products need not be hostile to users. Systems such as Multitrak from Multisystems feature context-sensitive Help tutorials and error messages written in plain English.

Ongoing support is vital for software as complex as a project management system. Some companies furnish unlimited toll-free telephone support; others charge either from the beginning or after an initial period of perhaps 30 days.

Further, large system vendors such as Multisystems and Project Software & Development offer field consulting services in conjunction with their software and can be a valuable resource to user organizations, to which the many options offered by software represent a new opportunity and challenge. In addition, Project Software & Development has a users group that holds annual meetings.

For most organizations, a fully capable project management system is not a trivial investment. Those involved in the evaluation process will want more than passing familiarity with the software before they make a commitment.

Demonstration diskettes may serve for the initial screening process, but evaluators at some point will want to spend time entering real company project data into a real system.

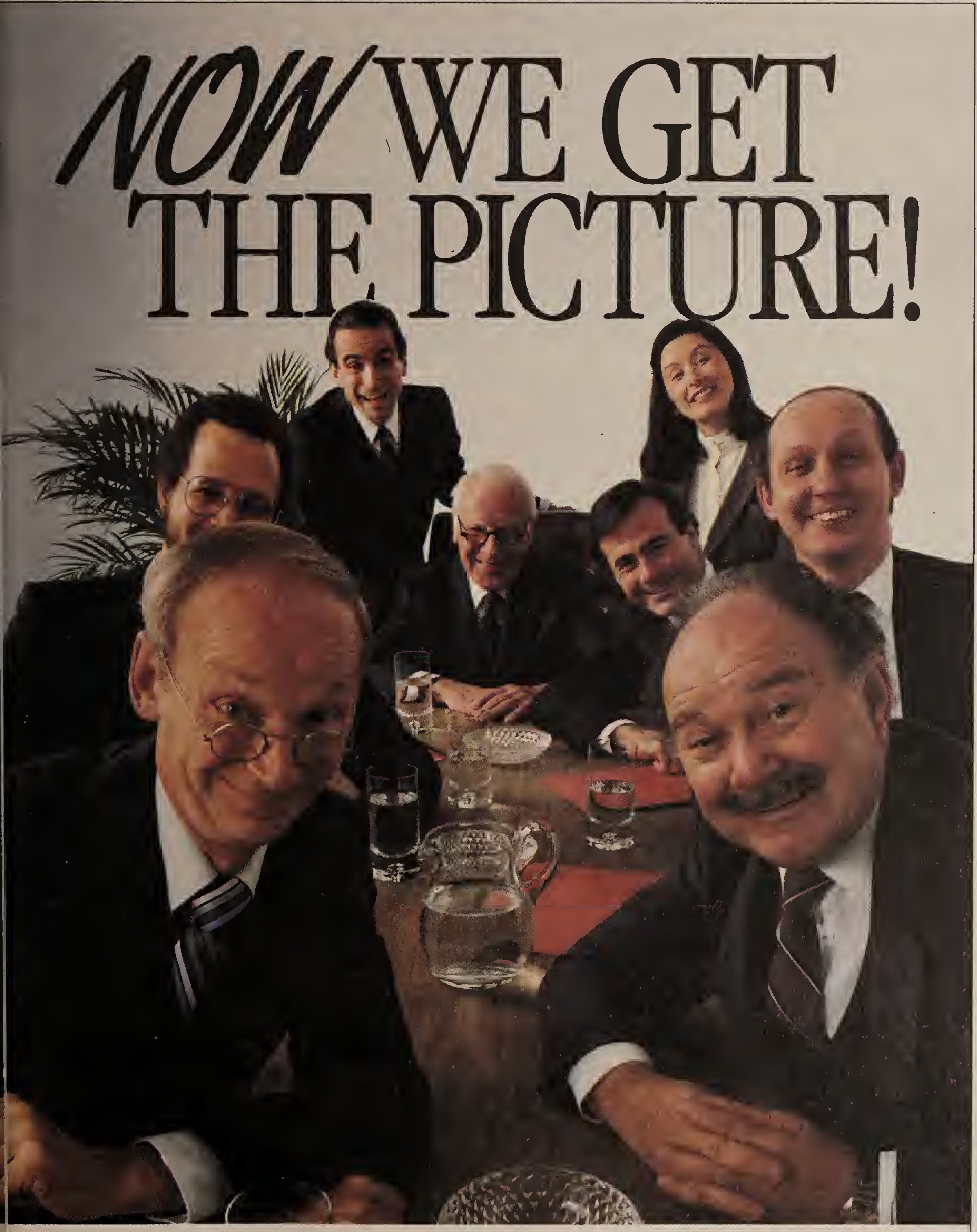
Some large system vendors will agree to a free 60- or 90-day trial, requiring the prospective customer to sign a nondisclosure agreement. Others offer on-site demonstrations or invite prospects to visit the vendor's facilities to try the system.

Evaluation options for buyers of PC-based systems are less extensive, and reliance on demonstration diskettes is heavier. But many vendors, particularly of high-end personal computer systems, offer a 30- or 60-day purchase price refund for dissatisfied buyers. Regardless of the size of the system being considered, it is always worthwhile to talk with and even visit companies that are using products under serious consideration.

Project management software, worthwhile and capable as it is, is no miracle worker. It is still up to the manager to make an accurate assessment of resource needs, activities and costs. Interpretation of results and intelligent decision-making remain in the province of management, not the computer.

But given adequate input, a computer-based project management system will not lose track of deadlines, forget what resources are needed on what days or stare at the ceiling in the middle of the night wondering if it has forgotten anything that should be in the report to management that is due tomorrow.

And if the computer doesn't do those things, then the project manager won't either. ■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PROJECT MANAGEMENT SOFTWARE

Company	Product	Follows Critical Path	Follows PERT	Number of Tasks/Project	Links Between Multiple Projects	Number of Resources/Project	Types of Precedents	Number of Predecessor Activities	Scheduling Units	Interfaces to Spreadsheet	Interfaces to Mainframe	Includes Graphics	Price
Accura Tech, Inc. 5422 Chevy Chase Houston, Texas 77056	*Timetable*	Yes	Yes	15,000	Yes	500	Finish to start, start to start, finish to finish, start to finish	Unlimited	Days, weeks, months, periods	Yes	Yes	Yes	$3,000-37,500
ADP Network Services Project Management Services 175 Jackson Plaza Ann Arbor, Mich. 48106	*APECS/8000*	Yes	Yes	32,000	Yes	256	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	Yes	Available upon request
AGS Management Systems, Inc. 880 First Ave. King of Prussia, Pa. 19406	*PAC II,* *PAC III*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	Yes	$44,000-$62,000
Aldergraph Systems, Inc. Suite 113 1080 W. Belt N. Houston, Texas 77043	*Aldergraph*	Yes	Yes	Unlimited	No	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	Days	Yes	Yes	Yes	$6000
Applied Business Technology Corp. 6th Floor 365 Broadway New York, N.Y. 10013	*Project Workbench*	Yes	Yes	Unlimited	Yes	200	Finish to start, overlapping finish to finish, overlapping start to start	Unlimited	Hours, days, weeks, months	Yes	Yes	Yes	$1,150
Applied Management Methods, Inc. 201 N. Broad St. Doylestown, Pa. 18901	*Topman*	Yes	No	Unlimited	Yes	50	Finish to start, start to finish, start to finish	30	User defined	No	Yes	Yes	Available upon request
Applied Microsystems, Inc. P.O. Box 832 Roswell, Ga. 30077	*Protracs 4.01*	No	No	400	Yes	400	NA	NA	Days	Yes	No	Yes	$59.95
	Empact 2.02	No	No	250	No	250	NA	NA	Days	No	No	Yes	$149.95
Andrew Sipos Associates 355-26B South End Ave. New York, N.Y. 10280	*ASAPMS*	Yes	Yes	5,000	Yes	999	Finish to start, start to start, finish to finish, start to finish	Unlimited	Hours, days, weeks	Yes	Yes	Yes	$6,400-$60,000
The Bridge, Inc. #2D 199 California Drive Millbrae, Calif. 94030	*TRAK*	No	No	Unlimited	Yes	Unlimited	Start to finish	Unlimited	Days	No	NA	No	$12,500-$21,500
Breakthrough Software Corp. 505 San Marin Drive Novato, Calif. 94947	*Time Line*	Yes	Yes	1,000	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	Minutes, hours, days, weeks, months	Yes	Yes	Yes	$495
Communication Dynamics, Inc. Suite 200 7300 S.W. Hunziker Tigard, Ore. 97223	*Timepiece*	Yes	Yes	Unlimited	Yes	Unlimited	Start to finish, finish to start	Unlimited	Hours, days, weeks, months, years, periods	No	No	Yes	$695
Computer Aided Management 24 Professional Center Pkwy. San Rafael, Calif. 94903	*Viewpoint*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish (all with lag relationships)	Unlimited	Hours, days	Yes	Yes	Yes	$1,995
Computer Associates International, Inc. Micro Products Division 2195 Fortune Drive San Jose, Calif. 95131	*Super Project Plus*	Yes	Yes	1,500	Yes	2,000	Finish to start, start to start, finish to finish	Unlimited	Hours, days	Yes	Yes	Yes	$495
Computer Cognition 225 W. 30th St. National City, Calif. 92050	*Acuity Project Scheduling*	Yes	Yes	3,000	Yes	20	Start to start, start to finish	55	User defined	Yes	Yes	Yes	Available upon request
Computerline, Inc. P.O. Box 308 52 School St. Pembroke, Mass. 02359	*Plantrac*	Yes	Yes	250,000	Yes	200	Finish to start, start to start, finish to finish, start to finish	16	Minutes, hours, days, weeks, months	Yes	Yes	Yes	First-year license fee $3,000; subsequent yearly fee $1,000
Construction Information Systems, Inc. P.O. Box 484 Mill Valley, Calif. 94942	*System 20/20*	Yes	No	Unlimited	Yes	Unlimited	Start to start, finish to finish, finish to start	Unlimited	User defined	Yes	Yes	No	Available upon request

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.
CW chart compiled by Linda Gorgone.

Product Spotlight/Project Management Software

Company	Product	Follows Critical Path	Follows PERT	Number of Tasks/Project	Links Between Multiple Projects	Number of Resources/Project	Types of Precedents	Number of Predecessor Activities	Scheduling Units	Interfaces to Spreadsheet	Interfaces to Mainframe	Includes Graphics	Price
Cybernetics Index, Inc. 416 Hungerford Drive Rockville, Md. 20850	*Project Planning and Control Module*	No	No	Unlimited	Yes	Unlimited	NA	NA	Hours, days, weeks	Yes	Yes	Yes	$795
Dekker Ltd. 214 E. Olive Ave. Redlands, Calif. 92373	*Trakker*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	Yes	$895
Demi-Software 62 Nursery Road Ridgefield, Conn. 06877	*Demi-Plan*	Yes	No	200	Yes	25	Finish to start	20	User defined	No	No	Yes	$50
Digital Marketing Corp. Suite 8 2363 Boulevard Circle Walnut Creek, Calif. 94595	*Milestone*	Yes	Yes	350	Yes	9	Start to finish, start to start	9	User defined	No	No	Yes	$99
Diversified Information Services Suite 130 4370 Tujunga Ave. Studio City, Calif. 91604	*AMS Time Machine*	Yes	Yes	10,000	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	Days	Yes	Yes	Yes	$2,500
Earth Data Corp. P.O. Box 13168 Richmond, Va. 23225	*Microgantt*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	No	Available upon request
Elite Software Development, Inc. P.O. Box 1194 Bryan, Texas 77806	*CPM-PERT*	Yes	Yes	600	No	2	Start to finish	NA	Days	No	No	Yes	$249
Engineering Science, Inc. 57 Executive Park Atlanta, Ga. 30329	*Plantrax*	Yes	No	700	Yes	10	Start to finish, start to start	NA	Days, weeks	No	No	Yes	$795
Environmental Services, Inc. #340 7831 Glenroy Road Minneapolis, Minn. 55435	*CRAM*	Yes	No	10,000	Yes	300	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	Yes	$26,000
Gantt Systems, Inc. 44 Stetton Road Piscataway, N.J. 08854	*Gantt-Pack*	No	No	Unlimited	No	Unlimited	NA	NA	User defined	Yes	No	Yes	$225
General Electric Information Services Co. 401 N. Washington St. Rockville, Md. 20850	*Project Visibility System*	Yes	No	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	days	Yes	Yes	Yes	Available upon request
Issco 1055 Sorrento Valley Road San Diego, Calif. 92121	*Tellaplan Professional*	Yes	No	2,000	Yes	Unlimited	Start to finish, finish to start	Unlimited	Fractions of hours, days, months, units	No	Yes	Yes	Available upon request
	Tellaplan Expert	Yes	Yes	10,000	Yes	Unlimited	Start to finish, finish to start	Unlimited	Fractions of hours, days, months, units	No	Yes	Yes	Available upon request
K & H Project Systems, Inc. #2 Glenhardie Corporation Center 1285 Drummers Lane Wayne, Pa. 19087	*Premis*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	NA	Yes	$100,000
	G/C Cue	Yes	Yes	32,000	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	No	Yes	Available upon request
Kepner-Tregoe, Inc. P.O. Box 704 Princeton, N.J. 08542	*Planning Pro*	No	No	200 at four levels	Yes	200	Start to finish	NA	User defined	Yes	No	Yes	$250
Lawco Ltd. P.O. Box 2009 Manteca, Calif. 95336	*ZIP*	Yes	No	999	No	98,000	Finish to start, start to start, finish to finish, start to finish	15	Hours, days, weeks, months	No	No	Yes	$198.98
Martin Marietta Data Systems, Inc. Information Technology Division Suite 325 98 Inverness Drive E. Englewood, Colo. 80112	*Technical Requirements Management System: Project Status*	Yes	No	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	No	NA	No	Available upon request

Product Spotlight/Project Management Software

Company	Product	Follows Critical Path	Follows PERT	Number of Tasks/Project	Links Between Multiple Projects	Number of Resources/Project	Types of Precedents	Number of Predecessor Activities	Scheduling Units	Interfaces to Spreadsheet	Interfaces to Mainframe	Includes Graphics	Price
McAuto K253 P.O. Box 516 St. Louis, Mo. 63166	*Management Schedule and Control System*	Yes	Yes	42,000	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	40	User defined	No	NA	Yes	$50,000
Metier Management Systems, Inc. Suite 1300 2900 N. Loop W. Houston, Texas 77092	*Artemis*	Yes	Yes	256,000	Yes	256,000	Finish to start, start to start, finish to finish, start to finish	256,000	Minutes, days, weeks, months, quarters, shifts	Yes	Yes	Yes	Available upon request
Micro Financial Software and Services 12233 Wood Lake Drive Burnsville, Minn. 55337	*Project Scheduler*	No	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	10ths of hours, hours	No	Yes	Yes	$199
Microsoft Corp. P.O. Box 97017 16011 N.E. 36th St. Redmond, Wash. 98073	*Microsoft Project 3.0*	Yes	Yes	999	Yes	255	Finish to start	16	Minutes, hours, days, weeks, months	Yes	Yes	Yes	$395
Mitchell Management Systems, Inc. Westboro Office Park 2000 W. Park Drive Westboro, Mass. 01581	*MAPPS*	Yes	Yes	Unlimited	Yes	10,000	Finish to start, start to start, finish to finish, start to finish	200	10ths of days, days	Yes	Yes	Yes	$12,500-$250,000
Monitor Software Suite 210 960 N. San Antonio Road Los Altos, Calif. 94022	*Task Monitor*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	21	Days, weeks, months	Yes	Yes	Yes	$695
Morgan Computing Co. P.O. Box 112730 Carrollton, Texas 75011	*Easy Gantt*	Yes	No	3,000	No	NA	Finish to start	Unlimited	User defined	No	No	Yes	$49.95
Multisystems, Inc. 1050 Massachusetts Ave. Cambridge, Mass. 02138	*Multitrak*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	Hours, days, weeks	Yes	Yes	Yes	$95,000
National Information Systems, Inc. Suite 130 20370 Town Center Lane Cupertino, Calif. 95014	*Vue*	Yes	Yes	3,000	Yes	100	Finish to start, start to start, finish to finish	55	User defined	Yes	Yes	Yes	$1,000-$37,000
North America Mica, Inc. Suite 110 5230 Carroll Canyon Road San Diego, Calif. 92121	*PMS-11*	Yes	Yes	2,750	Yes	NA	Start to finish	NA	Days	Yes	Yes	Yes	$1,295
Paladin Software Corp. Suite 178 2700 Augustine Drive Santa Clara, Calif. 95054	*Visi Schedule*	Yes	No	300	No	9	Start to finish	9	Days, weeks	Yes	Yes	Yes	$195
PC International Suite 800 4400 MacArthur Blvd. Newport Beach, Calif. 92660	*Easy Trak*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, finish to finish (with overlapping)	Unlimited	Hours, days, weeks, months	Yes	Yes	Yes	$15,000-$300,000
Pinnell Engineering 5331 S.W. Macadam Ave. Portland, Ore. 97201	*PMS80*	Yes	Yes	30,000	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	8	Days, months	Yes	Yes	Yes	$495
Poc-It Management Suite 606 606 Wilshire Blvd. Los Angeles, Calif. 90401	*Microman Project Control System*	Yes	Yes	Unlimited	No	Unlimited	NA	5 per node	Hours	Yes	Yes	No	$1,195
Primavera Systems, Inc. 29 Bala Ave. Bala Cynwyd, Pa. 19004	*Primavera Project Planner*	Yes	Yes	10,000	Yes	96	Start to finish, start to start, finish to finish	130	Days	Yes	Yes	Yes	$2,500
	Finest Hour	Yes	Yes	10,000	Yes	96	Start to finish, start to start, finish to finish	130	Hours, days	Yes	Yes	Yes	$5,000
Professional Applications 8265 Vickers St. San Diego, Calif. 92111	*Pert+*	Yes	No	5,000	Yes	Unlimited	Start to finish, start to start, finish to finish	Unlimited	Days, weeks, months, years	Yes	No	Yes	$1,195

Product Spotlight/Project Management Software

Company	Product	Follows Critical Path	Follows PERT	Number of Tasks/Project	Links Between Multiple Projects	Number of Resources/Project	Types of Precedents	Number of Predecessor Activities	Scheduling Units	Interfaces to Spreadsheet	Interfaces to Mainframe	Includes Graphics	Price
Project Software and Development, Inc. 14 Story St. Cambridge, Mass. 02138	*Project/2*	Yes	No	32,767	Yes	Unlimited	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	Yes	Available upon request
SAS Institute, Inc. Box 8000 SAS Circle Cary, N.C. 27511	*SAS/OR*	Yes	No	Unlimited	Yes	4,000	Finish to start	Unlimited	User defined	Yes	Yes	Yes	$1,500-$7,000 annual license fee
Scitor Corp. 250 Lincoln Centre Drive Foster City, Calif. 96002	*Project Scheduler Network*	Yes	Yes	2,000	Yes	Unlimited	Finish to start	9	User defined	Yes	Yes	Yes	$500
Sheppard Software Co. 4750 Clough Creek Road Redding, Calif. 96002	*Micro Pert 1*	Yes	Yes	220	Yes	128	Finish to start	Unlimited	User defined	Yes	Yes	Yes	$350
Simple Software, Inc. 2 Pinewood Irvine, Calif. 92714	*Project Master*	Yes	No	Unlimited	Yes	20	Finish to start	Unlimited	Hours, days, weeks, calendar and fiscal months, quarters	Yes	Yes	No	$399
Softcorp, Inc. Suite 244 2340 State Road 580 Clearwater, Fla. 33575	*Advanced Pro-Path 6*	Yes	No	250	Yes	60	Finish to start	Unlimited	Days, weeks, months	Yes	No	Yes	$199
Softext Publishing Co. Suite 605 17 E. 45th St. New York, N.Y. 10017	*Scheduling and Control*	Yes	Yes	50	No	2	Finish to start, start to start, finish to finish, start to finish	5	User defined	Yes	Yes	Yes	$95
Softrak Systems P.O. Box 22156 AMF 1977 W. North Temple Salt Lake City, Utah 84122	*Micro Trak*	Yes	Yes	5,000	Yes	Unlimited	Finish to start, start to start, finish to finish	9	Days, weeks, months	Yes	Yes	Yes	$595
Software Publishing Corp. P.O. Box 7210 1901 Landings Drive Mountain View, Calif. 94039	*Harvard Total Project Manager Version 1.1*	Yes	Yes	200	Yes	Unlimited	Finish to start	Unlimited	Minutes, hours, days, weeks, months, years	Yes	Yes	Yes	$495
Strategic Software Planning Corp. 245 1st St. Cambridge, Mass. 02142	*Promis*	Yes	Yes	Unlimited	Yes	Unlimited	Finish to start, start to start, finish to finish	Unlimited	Days	Yes	Yes	Yes	$2,995
T and B Computing, Inc. 1100 Eisenhower Place Ann Arbor, Mich. 48104	*Track 50*	Yes	Yes	14,000	Yes	100	Finish to start, start to start, finish to finish	Unlimited	Hours, days, weeks, shifts	Yes	No	Yes	$12,000-$45,000
Technisoft P.O. Box 2781 Leucadia, Calif. 92024	*Multiproject*	Yes	Yes	Unlimited	Yes	Unlimited	Start to finish	Unlimited	Hours, days, weeks	Yes	Yes	Yes	$2,500
Tevco, Inc. P.O. Box 22614 Sacramento, Calif. 95822	*CPSS*	Yes	Yes	Unlimited	No	36	NA	Unlimited	Days	No	Yes	Yes	$6,000
Unisys Information Systems P.O. Box 500 Blue Bell, Pa. 19424	*Optima 1100*	Yes	Yes	11,000 per network	Yes	511	Finish to start, start to start, finish to finish, start to finish	255	Hours, days, weeks, months	No	NA	Yes	$660 monthly leasing charge
Welcom Software Technology Suite 375 1325 S. Dairy Ashford Houston, Texas 77077	*Open Plan*	Yes	Yes	10,000	Yes	500	Finish to start, start to start, finish to finish, start to finish	Unlimited	User defined	Yes	Yes	Yes	$4,200
Westminster Software, Inc. 2570 El Camino Real Mountain View, Calif. 94040	*In Control*	Yes	Yes	75	Yes	29 per project, 10 per activity	Start to start, finish to start, finish to finish	Unlimited	User defined	Yes	Yes	Yes	$69.50
Xebek, Inc. 627 Washington Building Seattle, Wash. 98101	*Project Visibility System*	Yes	No	4,000	Yes	1,200	Finish to start, start to start, finish to finish, start to finish	8,000	Days	No	No	Yes	Available upon request

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Users mold VM in their systems' image

• Within similar environments, VM programmers are writing analogous code • Documented: heuristic learning achieved slowly, painfully • VM veterans share ideas with fellow programmers

By TREVOR EDDOLLS

A Xephon Technology Transfer Ltd. survey of 100 installations within the UK running IBM's VM operating environment revealed the following statistics:

- One in four VM sites has implemented at least one user modification.
- About two-thirds of the sites measure VM performance to perform capacity planning or to solve specific performance problems.
- One in three sites has encountered some difficulty in interfacing VM to other software.
- The majority of sites supplement VM with additional software from IBM or third parties.
- More than 40% have recently evaluated a VM-related product.

It is perhaps not surprising that with so many VM sites running similar environments, programmers have written analogous code. This could be viewed as either great minds thinking alike or as reinventing the wheel. Either way, it still means that man-hours have been spent finding a solution to a problem that has already been successfully solved elsewhere.

Another, more frustrating scenario is one in which one site has solved a problem, the solution to which is unavailable to another site that has an immediate requirement for it.

VM can be viewed simply as an environment within which users can run their own programs. While it obviously will function in this mode, its most significant feature is its ability to act as a supervisor for supervisors. One of the consequences of this flexibility is that throughout the approximately 15,000 installations worldwide, a variety of hardware and software products, many of which are not produced by IBM, are used in various combinations with VM.

At any site, the systems team — a term used to describe anything from one man who is responsible for all systems software to a group of dedicated VM specialists — must discover what types of software products are available, what products are offered in each area, how to install them, how to tune them and what impact — or benefit — will come from using the products.

As the editor of a monthly journal that acts as a forum for the views and experiences of VM users, I find it very encouraging that seasoned VM systems programmers are prepared to jot down their thoughts and opinions and make them, along with actual code, available to others working in the same area.

In general, the articles published in our journal represent heuristic learning achieved slowly and painfully by contributors from all parts of the globe. Some of these contributors are from uniprocessor sites with no communication links outside the building, running VM without any guest systems. Other users write from multiprocessor sites that are linked into international networks and that run a variety of remote systems.

Users' stories fall roughly into four categories: idiot-proofing, system enhancement, problem resolution and product discussion.

Idiot-proofing

Guido van Leuven, a systems programmer in Belgium with Texaco Europe, a division of Texaco, Inc., describes a problem many sites have encountered: A number of programmers, each controlling more than one virtual machine, are maintaining various suites of jobs, including EXECs, data files, job control cards and programs. Maintaining these files separately made tracking up-to-date versions difficult.

His solution was to group all the data under one user ID called FILEMNGR; this ID had read/write access to a number of minidisks. FILEMNGR's "A" disk contained log files and system EXECs. Effectively, only one person at a time could work on a production file, which would then replace the original when completed; a history

CW PHOTO

About the author

Eddolls is editor of VM Update, *a monthly technical journal published by Xephon Technology Transfer Ltd. in London. Xephon's U.S. representative can be reached at P.O. Box 4480, Winter Park, Fla.*

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file recorded what had happened. This meant that control was centralized and the previous problems disappeared.

In addition to idiot-proofing the work of programmers, idiot-proofing the work of operators can be useful as well. W. M. Anderson, a senior systems programmer with the National Insurance Co. in New Zealand, encountered problems when operators did an initial program load (IPL) of VM and later turned a device's power off, resulting in the failure of various AUTOLOGs. At other times, the operators had done an initial program load with an incorrect system date, requiring a re-IPL to fix it.

Anderson overcame the problem by writing a set of Restructured Extended Executor language (REXX) procedures that automated more of the operator's entry work. These procedures are started when the operator enters "IPL CMS" following the appearance of the message: DMKCPJ966I INITIALIZATION COMPLETE.

System enhancement

Among the suggestions received for system enhancement is one from Crispin Hugo of Redlands Information Systems Ltd. in Reigate, Surrey, England. Hugo tuned his VM/VSE system by ensuring that all files were effectively and efficiently placed in storage.

To do this, he first needed a method of finding which cylinders on direct-access storage devices (DASD) were most heavily used, and the method itself must not utilize too many CPU cycles or generate too much additional, unwanted data. The data was to be collected continually for later analysis. Hugo achieved this by using a series of straightforward EXECs.

Other system enhancement suggestions that were offered include the following:

- Many users of IDCAMS (the Access Methods Service program) have described the output produced by the program's LISTCAT command as being rubbish, as having low readability and as being acceptable but voluminous and much too complex. Peter Cornelius, a systems programmer from Swansea, England, has written an EXEC that will produce both a standard catalog listing or, optionally, a more easily readable and usable summary listing.
- Like VSAM, using CICS under a guest operating system under VM can cause problems. Some sites have experienced difficulties with CICS users being assigned different CICS terminal IDs when they use VM-DIAL. Alfred Schaal, from RAFI in Ravensburg, West Germany, has written a solution to the problem by using some simple assembler amendments that allow the terminal users to get back into CICS easily.
- Alan Bodill, software support manager from Memorex Corp. in Uxbridge, England, has found a modification to module DMKTRA that traces I/O in a virtual machine. This method, which allows the user to select which devices are to be traced, can be particularly useful if the virtual machine selected is a guest system such as MVS.
- With VM there is no control program (CP) command to get the current SPOOL (TEMP area) utilization. Warning messages are sent to the operator only when the SPOOL is 90% or 100% full. The former message is often missed by the operator, and the latter — at 100% — is often too late. If the system crashes at this point, SPOOL files may be lost while the operator performs

> ”
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> *It is perhaps not surprising that with so many VM sites running similar environments, programmers have written analogous code. This could be viewed either as great minds thinking alike or as reinventing the wheel.*

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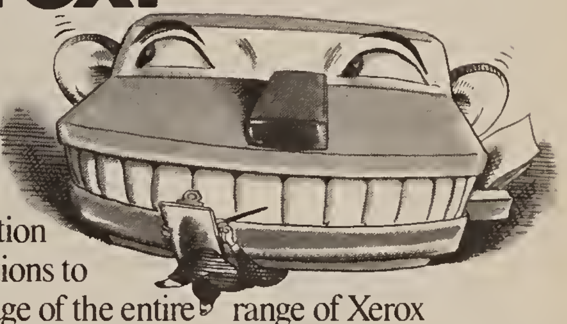

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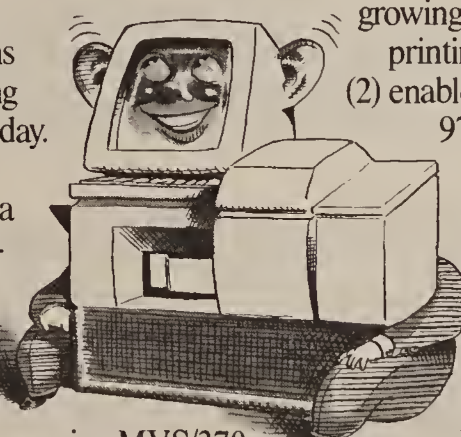

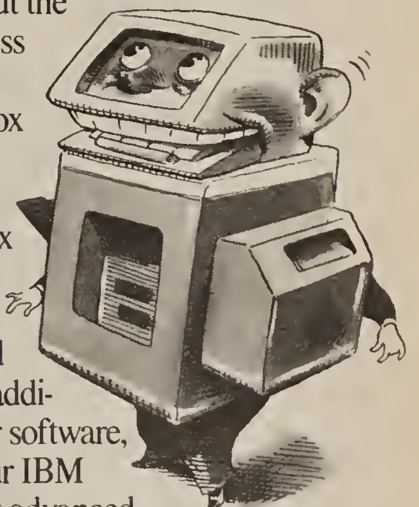

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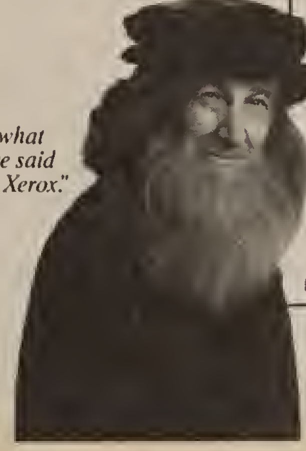

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an initial program load. Even if the CKPT (checkpoint) routine is completely successful, time will be lost.

W. H. Sau, computer projects officer with Cathay Pacific Airways Ltd. in Hong Kong, developed an assembler program that would calculate and display the current SPOOL utilization. The program can be invoked from any user ID with privilege class C or E. It uses the maximum number of available pages stored in DMKPGTTM and the number of currently used pages stored in DMKPGTTU. A VM DIAGNOSE instruction is used to read the symbol table DMKSYM and get the contents of DMKPGTTU and DMKPGTTM so the contents can be compared.

As well as knowing the SPOOL utilization, situations can develop in which it can be quite useful to know what commands have actually been entered by users at CMS terminals. John Kinne of Miami University in Oxford, Ohio, sent in a useful EXEC called Qcommand that finds and formats the RETRIEVE buffer, provided a user has activated this function. The EXEC will display the RETRIEVE buffer of a user ID or, if the RETRIEVE buffer is not present, will display the last CP command issued.

- Randy Rhine, a senior systems programmer in the U.S., sent an assembler program that performs a variety of useful services with tapes. The program will scan a tape and display record lengths. If 80-byte records are read and have standard labels, the label information is displayed.

A count option can be used to count the number of records in a file and display it when a tape mark is reached. The length of the largest record and whether it is a fixed- or variable-length file are displayed. Another option will display the volume serial number of the tape. All the options have a variety of applications that can be used from CMS.

- Although submitting jobs from CMS to run under a guest operating system such as VSE usually creates no problems, returning the results to CMS can. One method typically used is for the VSE or MVS guest to send print-file results to the reader of a "routing" virtual machine. The machine, which has been previously autologged, automatically processes each job using a lookup table to determine the "owning" user ID. One problem with this is the need to maintain the lookup table; another is that the use of the job name is restricted for accounting purposes.

Chris Hobbs, a director with Information Management Ltd. in Bristol, England, suggests another method for returning results that makes use of the REXX function DIAG. Information in the first block of spooled input can be examined to determine whether the file has to be routed to a specific user ID.

He achieves this by inserting a dummy comment after the job card prior to sending the job to the guest system. The card is ignored when the job is processed but does occur in the first block of spooled output. The EXEC that he included is devised to insulate end users from the mechanics of CMS when the users are using interactive packages.

- Nick Williams, a technical consultant with Grand Metropolitan Information Services in Uxbridge, England, detailed what use his company made of the VM Programmable Operator (Prop) facility at his site and what extensions were made to the facility to make both the operators' and the system administrator's lives easier.

The company set up the system so that Prop ran on the system operator's virtual machine. All disconnected service machines — such as Remote Spooling Communication Subsystem, passthru and Virtual Communication Network Architecture — had Prop defined as a secondary user. This meant that all activities were recorded in the Prop log, thus providing a single reference point for all VM activity.

In addition, the company installed a facility that eliminated the intervention required to display successive screenfuls of information: a rolling screen. Important messages were clearly identified, not lost by accidental clearing. Unnecessary message information, such "MSG FROM" prefixes, was trimmed. All commands and their subsequent responses were sent to Prop for logging. Williams also sent in an EXEC that could be used to search and display Prop records.

Problem identification

Along similar lines are some ideas from Jerry Kevokian, the manager of IBM system software with CE-GEBO in Portsmouth, Va. Kevokian says that in the majority of sites, the DP department tries to identify problems before the end users do. The department is often hampered in doing so by budget restrictions and operator number limitations.

In addition, Kevokian describes how to build a simple VM monitor. He wrote an EXEC that loops continually under its own user ID and monitors whatever is identified to it as key resources. The user of this EXEC must decide what constitutes a problem state — such as a line OFFLINE or DISABLED — and how often a resource is to be checked.

The EXEC uses the EXECIO command to place responses to QUERY commands in the console stack so that the responses can be used later by an EXEC checking for exception conditions. All exception conditions noted are sent to the operator's console so that appropriate remedial action can be taken.

Many of the stories overlap in intent and content. For example, many have described enhancements to XEDIT that allow more word processing-like functions. Also, the relationship between VM's SPOOL and the guest operating system spool is an area that is frequently enhanced

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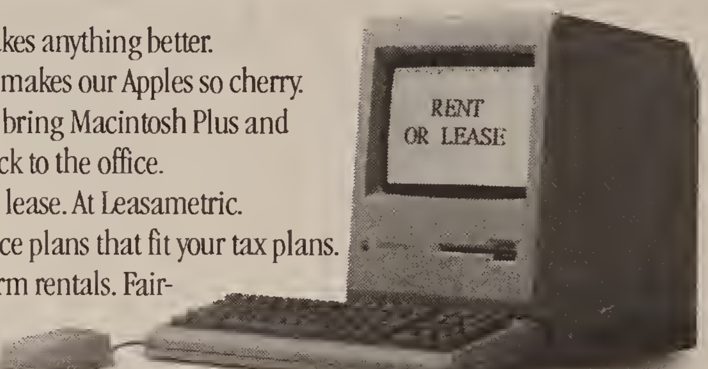

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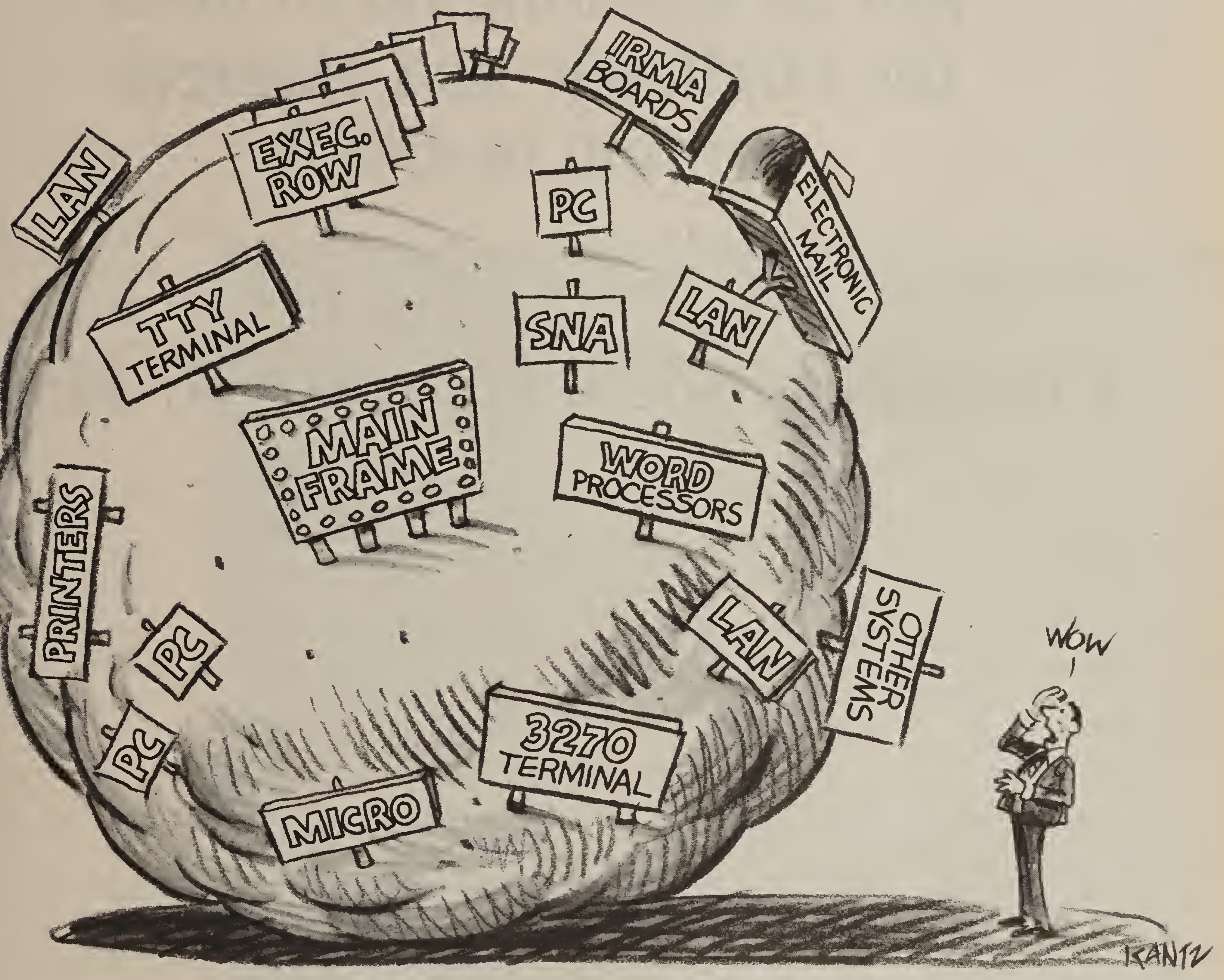

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John Illingworth of Empire Stores in Bradford, England, uncovered a problem when running production work on an IBM 3083 under VM. The system activity display showed primary channels reaching 60% to 70% capacity, yet the secondary channels barely reached 10%.

He deduced that the 3083 queues I/O in the channel and does not tell the software when the channel is busy. This means that I/O will be queued even though there may be an available path free.

Illingworth wrote an assembler modification to DMKIOS (or DMKIOQ, depending on VM release) that flip-flops the path to a device for every I/O request. This, he believes, will work well at a number of installations.

A similar problem is reported by Cory Heikel of the Pennsylvania Liquor Control Board in Harrisburg, who noted problems with "ghost" users. This is a situation in which end users trying to log on find that they receive a message saying that the ID is already logged on. Forcing a logoff appears to be successful, but the user is still unable to access VM.

IBM's solution was to have the operator reinitialize VM. Research showed the problem to be caused by two conflicting bit settings in the user's VMBLOK. Heikel supplied an assembler program that, he suggests, will typically solve the problem without an initial program load.

Another regular difficulty can be found with end users and systems programmers who delete a file for which no tape backup exists. David Raine, a senior systems programmer for Darchem Ltd. in Darlington, England, supplies a way of recovering the file that works for fixed-block architecture devices, provided that the program is applied immediately.

CMS keeps two directories on the front of minidisks and flip-flops between these directories as changes are made. A file deletion causes the directory entry to be removed and that directory to become active. Raine's assembler program flips the directory back so that its entry appears in the old directory and the file can be accessed.

Matti Gronroos, a VM specialist with the Finnish State Computer Centre in Espoo, had encountered some DMKFRET problems and wanted to use the CP FRET TRAP. However, he found that the manuals supplied by IBM were not particularly helpful. He worked out a way to use the trap and to interpret the output. He described in detail the structure of the trap and provided guidelines on how to read the dumps.

Product discussion

Product discussion often cuts through the barrage of hyperbole that the salesmen present, thus helping those sites or programmers who are newcomers to VM to make a decision on which products to try.

For example, Peter Cornelius recently wrestled with the problem of which commercial product to use to automate the backing up of files. He tried VMbackup from VM Software, Inc., Syback from Syncsort, Inc. and Dynam/CMS from Computer Associates International, Inc.

In his contribution, he describes the particular requirements of his site and evaluates the performance of each of the products, explaining why his final choice most suited his needs and was subsequently installed.

> ”
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> ***Product discussion often cuts through the barrage of hyperbole that salesmen present, helping programmers who are newcomers to VM make a decision on which products to try.***

Keith Burton, from the University of Kentucky Hospital in Lexington, was trying to monitor his already installed system. He reported on a product that was new to his installation — Candle Corp.'s Omegamon/VM. Burton describes the product as a performance monitor that is short-term in nature, providing a detailed view of the environment over the previous few seconds rather than providing long-term reports and statistical displays. He says that it makes an excellent assistant for operators but is fairly difficult to learn to use.

The Cinderella system

IBM's VM operating system has had a somewhat checkered history. The story goes that VM, which evolved from a control program for the 370/67, at one point had its future hanging in the balance. Should IBM kill it or release it?

T. Vincent Learson, IBM president, watched a presentation from the MVS group that argued convincingly for the axing of VM. For this Cinderella system, the clock was striking midnight.

After the presentation, Learson noticed that the MVS development team itself was running MVS under VM. Soon thereafter, VM was released and now appears to be a strategic product.

With IBM releasing VS/XA, it would seem that the product is here to stay and so, therefore, are its problems. The Cinderella system went to the ball, but will it live happily ever after? ■

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Corporate graphics:

Take a look at the big picture

• Growth of graphics systems brings user benefits, corporate concerns • Critical concern for users: transportability • MIS action on acquisition control and guidelines required now

By BRIAN MCGRATH

Graphics systems are in vogue. As the latest corporate productivity tool, these systems proliferate in nearly every large organization, often with as little standardization as was first seen in stampedes to acquire personal computers.

Sophisticated graphics workstations and desktop publishing systems are already giving users a taste of local computing power for graphics. Managers are putting departmental budget allocations into pie charts, comparing sales and performance figures on bar charts and studying trend data in line graphics rather than in tables of figures. They will soon begin demanding access to more computer resources for increasingly sophisticated applications and will need systems with a high degree of transportability.

However, these graphics systems have significant incompatibilities — for example, different data sets or formats that run on different types of hardware. These incompatibilites, while not fatal in stand-alone applications, will severely limit the future value of uncontrolled investments in graphics hardware and software.

Despite the lessons of history, many MIS management teams seem uninterested in learning who uses graphics systems, what they use these systems for and how important they are to the future of the organization. In fact, a few MIS managers are hoping the graphics vogue will dissipate.

One rumor beginning to circulate among MIS managers is that stand-alone graphics systems will shortly be shaken out of the market because financial, word processing and other applications packages will soon include some graphics capabilities. Anyone who understands the use of graphics knows this argument is patently absurd — as absurd as arguing that third-party applications packages eliminate the need for report writers, programmers and custom applications.

Because graphics are used as a corporate productivity tool, users will always need graphics capabilities that are separate from specific applications. More than half the applications now in use in DP shops worldwide do not come from off-the-shelf packages; rather, they are custom-written applications or products of applications development systems. Where will users of these applications obtain their graphics capabilities if not from stand-alone graphics systems?

A corporate productivity tool

Bally, Inc. in Chicago has made a massive commitment to graphics and is putting virtually all its management reports into graphic form for analysis and presentation. For example, Bally's administrative department worked up a stacked bar graph showing historical and projected attendance at each of the company's amusement parks, raw insurance costs and costs per person. This graph clearly indicated the declining cost of insurance.

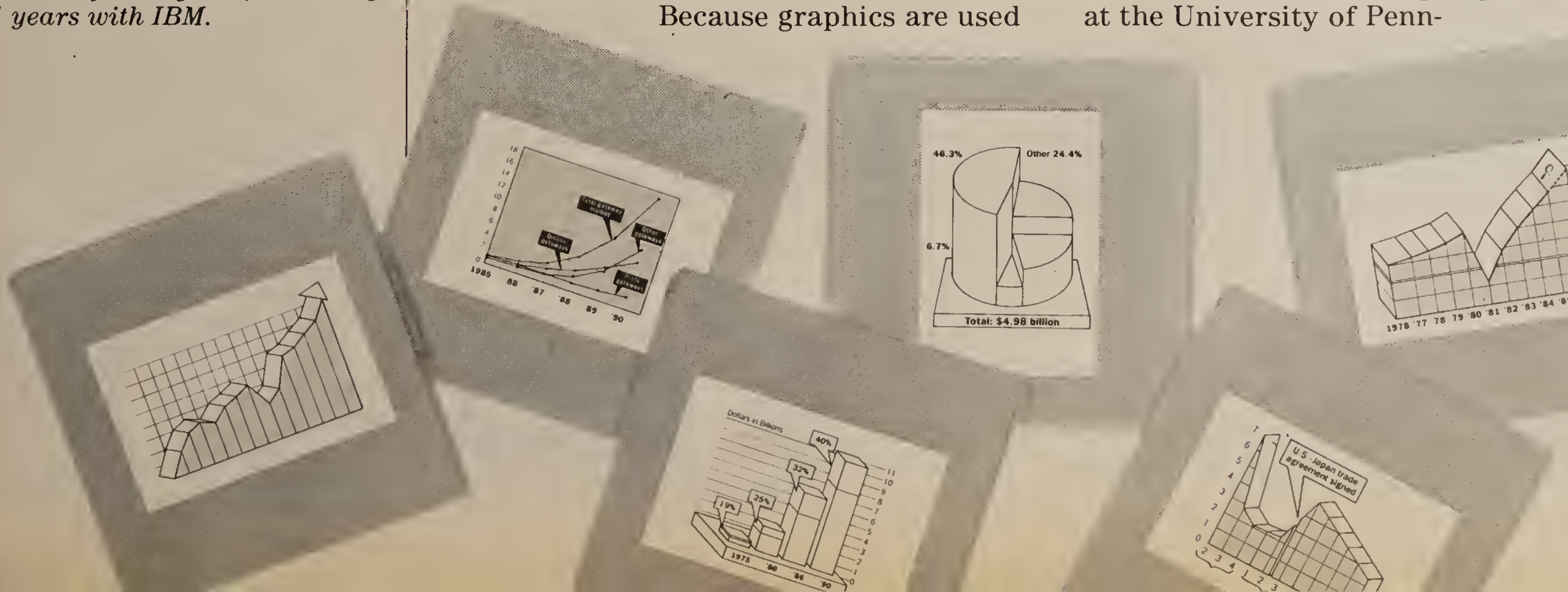
The company's finance department uses graphics as a back end to traditional modeling, what-if analysis and forecasting. However, users in this department bypass the applications' built-in graphics and dump their modeling results into stand-alone graphics programs.

Two or three applications packages suddenly appending some graphics capabilities are not enough to satisfy every graphics user. During the next few years, a bewildering variety of graphics systems will find acceptance in the market because every user and every business has unique requirements. Users will benefit from their graphics systems, but organizations will suffer from their incompatibilities. The big loser will be MIS management, suddenly asked to tie these systems to other corporate resources.

Graphics have more of an impact on readers than tabular reports. An analogy can be drawn from studies comparing the impact of newspaper news and television news on an audience. Ongoing research at the University of Penn-

About the author

McGrath is founder of McGrath and Associates in Plano, Texas, which consults on software selection for corporate MIS installations and performs market research analysis. McGrath held DP management positions for 28 years, including 11 years with IBM.



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> *Organizations will benefit by thinking of graphics systems not as single-purpose packages for inventory management or payroll but as general-purpose programs that different users can work with in different ways to accomplish different goals.*

sylvania's Annenberg School of Communications in Philadelphia shows that many people prefer television to print as a source for their information.

Visual impact

The studies indicate that TV news helps these people feel they grasp the essentials of a situation even though TV goes much faster and conveys fewer details than a newspaper.

Additionally, and more important, more people were shown to be swayed by television than by print.

Similarly, graphics give people a quick picture of the information but do not necessarily convey all the details of a tabular report.

People tend to prefer, and indeed can be swayed by, graphical information over straight columns of figures not only because the former is more visual but because it also takes less time to absorb.

Graphics are therefore a tool for making the best decision in the shortest period of time. For organizations far-sighted enough to implement them, graphics offer a major strategic business advantage.

General-purpose uses

One of the basic misconceptions that MIS management has about graphics is that they are seen mainly as a vertical application for engineering or design work. Recent surveys show that more than 70% of all graphics systems are used generally across a wide set of corporate departments for data analysis and presentation.

For example, Polaroid Corp. uses a personal computer-based graphics system at its factory in Waltham, Mass., to develop trend data on a variety of information, such as manufacturing machine uptime and yield as well as machine operator performance.

Data for these and other graphics applications has been collected for years, but managers are now putting them in graphics form to reduce the time needed to understand them. The data packages simplify month-to-month comparisons and allow management to study a five-week moving average overlaid on current data.

The treasury department at Bally uses graphics extensively in its presentation at an annual bankers' meeting, showing the patterns of such variables as funds available to the company, financing sources and structure, banking services used and the costs of these services.

These and most other applications of graphics are usually based on statistics and analyses that were previously done. The main difference is that now users put the data into special software for presentation and analysis in graphics form.

Graphics have become another corporate productivity tool. Organizations will benefit by thinking of graphics systems not as single-purpose packages for inventory management or payroll but as general-purpose programs that different users can work with in different ways to accomplish different goals.

A difference in users

There is one major difference between the current proliferation of graphics systems and similar recent trends. Today's graphics users are much more sophisticated than those who drove the microcomputer and telecommunications revolutions.

The first generation of microcomputer users simply saw the new computers' capabilities and wanted one on their desktops, giving no thought to the corporate consequences of their helter-

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Cellular telephones may take a back seat to a proposed satellite system when it comes to making long-distance calls. The mobile satellite network, consisting of two Hughes Aircraft Company HS 393 spacecraft, would relay two-way voice and data communications services directly from airplanes, cars, trains, or remote locations. While cellular telephone systems are limited to areas equipped with fixed antenna networks, mobile satellites would cover the continental U.S. and Canada, and possibly Mexico. Users would have their own mobile ground terminals. Hughes Communications Mobile Satellite Services, Inc. is seeking authorization from the Federal Communications Commission to operate the system.

Computers will be troubleshooting hybrid microcircuits used in new sophisticated missiles at Hughes. Computer-aided troubleshooting (CATS) will cut troubleshooting time, improve effectiveness by automatically locating faults, eliminate mistakes and wasted time, and simplify the technician's decision-making. CATS also will be able to use past repair records as a key to speed up troubleshooting. A typical case: An automatic bar code reader identifies a failed part, and data about the failed test is retrieved from a main computer. A probe then automatically takes measurements at key internal circuit nodes so the fault can be isolated. Next, the computer displays a schematic of the failed circuit area and compares the actual and ideal signal values. The technician then determines which component has most likely failed and selects rework instructions accordingly.

Infrared sensor transplants would enhance Air National Guard F-4 Phantoms for approximately one-tenth the cost of developing a new infrared system. Hughes has developed a concept to transfer Infrared Search and Track (IRST) systems to F-4 aircraft from deactivated U.S. Air Force interceptors. IRST detects targets passively and supplements radar detection. It would allow a pilot to establish and maintain target tracks when the F-4 radar couldn't pick out targets because of clutter, countermeasures, or malfunctions. Hughes built IRST in the 1960s to provide low-altitude detection and countermeasure capabilities for the F-101, F-102, and F-106. The systems have been upgraded, most recently in 1980 with a new detector that improved performance and cut operating costs.

Enhancements to NATO's air command and control system will include provisions for interoperability among all member nations, as well as a variety of systems that will prevent gaps in the network. These enhancements to NATO's C^3I (Command, Control, Communications, and Intelligence) system will also include the expanded use and reliance on advanced high-speed digital computers to sort vital information from sensors and immediately relay it to commanders in the most useful form. Hughes is part of an international team that is studying NATO's needs and defining just how the command and control network should be upgraded.

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Graphics' best use: Decision support

By JOAN-CAROL BRIGHAM

The use of business graphics has been scrutinized closely during the past few years, both through university-based studies and through work done by independent market research firms. The results gathered from these studies are useful to vendors of business graphics software as well as to users still skeptical about the worthiness of business graphics.

An extensive study is being conducted by the Management Science Department at the University of Minnesota in Minneapolis. This project, called the "Minnesota Management Graphics Project," began in 1983 and will continue through 1988 or 1989.

The study is particularly revealing because it is purely an objective view of the use of business graphics in statistics, education, marketing and information systems. The object, simply stated, is to separate myths from facts regarding graphics in decision making.

The bottom-line results of the published preliminary findings state that business graphics are best used for decision support and for communication of general trends and ideas. Charts are used most appropriately in detecting subtle trends, patterns of occurrence in data and changes or patterns that develop with time. The latter usually encompasses a large amount of data that could be unwieldy to wade through without graphics.

According to the study, analysis and decision making are the primary uses of graphics. The primary user is the middle manager. There is speculation that this function will move to lower levels as the learning curve is lessened, helped by easier to use software and standardization on a user interface.

A major finding in this ongoing report is that the use of graphics for decision support is expected to increase in the next three years. Oral presentations using graphics ranked as the fifth largest growing sector.

An October 1981 communications study done by the Wharton Applied Research Center of the Wharton School at the University of Pennsylvania set out to determine how visual aids influenced decisions made in meetings. The primary conclusions of this study, entitled "A Study of the Effects of the Use of Overhead Transparencies on Business Meetings," are that information is retained, attention to a presentation is increased and meetings are briefer and more meaningful when visual aids are used.

The outcome not only shows that those using visual aids swayed their audience 67% of the time, but also that meetings were 28% shorter. However, to put this study into perspective, the visual aids used were primarily word charts.

The findings of the Minnesota study compared with the Wharton study may appear to be contradictory. The Minnesota study focuses on graphics defined as the symbolic representation of quantative data, while the Wharton study focuses on presentations with visuals, which could be defined as anything from word charts to business graphics.

Color of least concern

An independent study, titled "Graphic Output: End-User Requirements," was conducted by Framingham, Mass.-based International Data Corp.'s Printer Market Program to determine the needs among specific graphics application segments for graphical hard-copy output. Questions were asked regarding frequency of use, application type, functionality requirements and printer/plotter satisfaction. The types of computer systems used were split between mainframes and minis (43%) and personal computers (57%).

The five dominant application areas that emerged were presentation graphics, decision-support graphics, engineering and scientific graphics, graphic arts and publishing. These applications were the users' primary application.

Users were asked to rank the importance of a number of specific graphics factors on a scale of one to four. Users ranked the importance of color output, multipie fonts/character sets and text/graphics integration. The following conclusions can be drawn from these results:

• The importance of color was of least concern to the typesetting community and of greatest concern to the presentation business community. The majority of the typesetter's work involves the black-and-white printing of books and other media not conventionally dependent on color.

Presentation business graphics depends on color output for emphasizing points and maintaining audience attention. As expected, all presentation business graphics software offers color capability.

• Multiple fonts per character sets were of greatest importance to the typesetting community. Variation in this medium comes predominantly from a variety of fonts.

The scientific and engineering community was the least interested in this capability. Its output is primarily graphical; text is used simply for annotations, titles and notes. A variety of fonts is not a top priority in the general scientific market (this excludes technical publishing).

• The integration of graphics and text is of primary importance to the in-house publishing community. Once an elegant, easy and versatile way to integrate is found, this market will grow rapidly.

The graphic arts community found this capability least important. The work of a graphic artist is graphics intensive, so the amount of text that needs to be integrated does not warrant a dedicated and sophisticated system. ■

Brigham is a consultant at International Data Corp. (IDC) based in Framingham, Mass. This article is excerpted from an IDC report, "The Business Graphics Software Market." *Copyright © July 1986 by IDC. Reprinted by permission.*

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skelter decisions.

Current graphics users recognize graphics as a complex technology that requires careful planning and a solid strategy. They are concerned about standards, hard-copy devices and what MIS can and cannot live with. Today's graphics users are turning to MIS for guidance in graphics acquisitions, hoping to get help in making decisions that are good for the organization.

MIS management can begin responding to these users' needs right now. MIS departments can help their organizations by investigating end users' immediate and long-range needs, problems and opportunities to make use of graphics systems before too many more acquisition decisions are made.

Productivity dictates active role

Although MIS management would have to play some role in graphics systems acquisition and use even if it were only a vertical application, the importance of these systems as productivity tools dictates that MIS management take an active role in developing graphics capabilities now. These capabilities include data acquisition from corporate data bases, detailed displays for on-line analysis and presentation and hard-copy output to high-resolution printers and perhaps plotters.

The time is ripe for MIS management to act. The proliferation of personal computers has given end users general independence from centrally controlled applications. Additionally, graphics packages have whetted these users' appetites for more sophisticated and complex graphics capabilities on larger systems. Users are now asking for mainframe packages with the same capabilities they enjoy on their micros: ease of use, interactive control, simplified menus and flexible options for color, three-dimensioning, texturing and more.

Another factor driving the shift to graphics is the growth in technology. Higher resolution terminals, color displays and color hard-copy devices are making graphics much more vivid and practical than in the past.

In an ideal world, MIS management could continue to ignore the trend toward graphics without paying the inevitable price, because any systems that users could select would conform to a consistent and useful standard. But in the real-world marketplace, there is widespread confusion.

For example, with their microcomputers, IBM offers not one but four different graphics standards. Each of these standards — monochrome, color graphics, enhanced graphics and professional graphics — supports different capabilities and requires different software.

Graphics code written for one IBM graphics standard will not always run on an identical IBM computer using a different standard. Even if data display is possible, separate complexities associated with output devices — laser printers, dot matrix printers, impact printers and plotters, each with their own developing, but so far unstandardized, requirements — limit the number of available options.

Only MIS management is in a position to rationalize the choice of graphics packages, peripherals, options and applications.

One of the critical concerns that only MIS management can oversee is that of transportability. Some of the leading graphics vendors have been stirring up a controversy over whether graphics work best at the PC level, the departmental (minicomputer) level or the mainframe level. By sheer coincidence, each vendor

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argues that graphics belong at the very level at which its software and systems are strongest.

While vendors argue, incompatible graphics systems running on a range of machines continue to create difficulties for MIS and for users. Some systems provide different capabilities and require different user instructions to operate. Others may store data in different formats, inhibiting the free flow of information from one level to another. Still others may not be able to store and display graphics created on one of the other systems, requiring users to repeat their work when transporting data.

If the graphics systems cannot communicate adequately, users may not be able to pull data from a mainframe data base for graphic analysis on a desktop micro or prepare a chart on one processor for printing or plotting on a peripheral controlled by another. Different graphics systems may be so incompatible that users have to rekey large data files before a different system can generate graphics from that data.

MIS management's leadership for both users and vendors is required to make it understood that the organization can make better use of graphics capabilities if it is not confined to a particular environment.

Graphics are useful at all levels and can be efficient at all levels if properly selected and set up. The best goal toward which MIS can strive is that of transportable graphics capabilities. With transportable graphics, the availability of resources and data — not of software — determine on what machine users do their work.

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> *Vendors put very little effort into MIS sales; they carefully sidestep issues of corporate standards and transportability. You can be sure they will not change their strategy until MIS management takes a much firmer grip on acquisitions.*

Transportable graphics lets users send data down from a mainframe to a departmental processor or micro for special applications. Transportability also allows users to run software in a stand-alone mode at each level so that they can run a graphics package on a PC for one application, on the departmental machine for another application and on a mainframe or 32-bit workstation for an engineering or scientific study. This software should transcend different hardware vendors and ideally have the same user operating instructions in all environments.

Gain vendors' attention

So far, MIS management has not participated adequately in the proliferation of graphics systems. Although MIS has to sign off on the graphics purchase in about 70% of corporate acquisitions, the bulk of the research and system selection is actually done by users, with MIS management serving mainly to ratify individual choices.

Reflecting this pattern, graphics shows today are generally 80% to 90% directed at end users, including such specific vertical applications as computer-aided design, three-dimensional modeling, desktop publishing and contour mapping. Vendors put very little effort into corporate MIS sales; they carefully sidestep issues of corporate standards and transportability. You can be sure they will not change their selling strategy until MIS management takes a much firmer grip on acquisitions.

If MIS management sets a corporate strategy, three things will happen:

- First, more users will experience major benefits in being able to access and use corporate data and resources, unhindered by incompatibilities between the DP department and end-user computers.
- Second, the organization will find it much easier to run important graphics applications where desired because they initially avoided making poor choices when acquiring their graphics systems.
- Third, organizations with strategies for graphics will find they hold a competitive advantage over companies that have not set an efficient strategy, purely because graphics are dozens of times more effective than tabular methods of data presentation and analysis. Graphics can produce an emotional impact that tables and statistics cannot match.

Formulating a solid graphics strategy is relatively easy, too. In fact, since standards are barely on the horizon and new uses for graphics are still emerging in unsuspected places, the best strategy is merely to set up a set of guidelines for users to follow.

Guidelines are easy for MIS to establish, and they give users a relatively firm basis for rationalizing their graphics systems selections.

Acquisition guidelines

A basic set of guidelines for future graphics acquisitions and usage could cover the following:

Transportability. Software selected can be part of a family of software packages that run on a range of processors used by the organization. Currently there are packages that run on the IBM Personal Computer AT, on Digital Equipment Corp. VAX machines and other departmental processors and on

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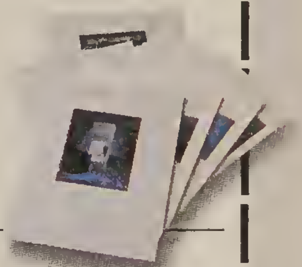

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> ”
>
> *In an ideal world, MIS management could continue to ignore the trend toward graphics without paying the inevitable price, because any systems that users could select would conform to a consistent and useful standard. But in the real-world marketplace, there is widespread confusion.*

mainframes and use the same operating instructions.

Your main vendor's graphics standard. IBM is promoting Graphics Kernel System (GKS) or Programmer Hierarchical Interactive Graphics Standard, for example, while DEC is supporting GKS only. These software or firmware subroutines are a critical element in transportability and graphics capabilities. To venture far from your main vendor's standard is to magnify support problems and invite user difficulties. Rather than accept vendor hype that is not backed up with product, check out the vendor's newly announced graphics products for the truth about available standards.

An efficient graphics technique. Most graphics hardware and software advances are now raster-based for flexibility and greater efficiency in color and complex graphics operations. But vector techniques, epitomized by pen plotters, still have their uses. MIS can justifiably support both but should be aware that the technique chosen affects the resources required for particular graphics applications.

A designated graphics guru. One member of the organization should be charged with staying current on graphics issues and opportunities, acting as a liaison to users and helping make all graphics decisions within the corporation. The graphics guru can also educate users about what makes for good graphics.

Since graphics concentrate information, users will have to be smarter about producing their reports. They will have to understand what is essential information and what is not as well as how to present key information in a graphics format.

Right now, relatively little information in the corporate world illustrates how to present and analyze data graphically. Most users learn their graphics skills through trial and error. Most business graphics packages facilitate this heuristic learning process by providing fairly simple means of presenting a given data set in a variety of shapes, sizes and, where possible, colors. Users can readily experiment to see which graphics pattern provides the most clarity and impact for a given set of data.

In the future, MIS will become increasingly responsible for training in both good graphics techniques and corporate policies for the presentation of data in graphics form. Books, tapes, seminars and users groups will offer additional information, and corporate graphics communications specialists will emerge in the managerial and professional ranks.

A positive experience

The advent of graphics is more significant than the conversion from batch to online processing. Effective communication through graphics will become extremely important because people and organizations that learn to communicate fluently with graphics will quickly prove more effective and competitive than those that do not.

MIS managers who do not act quickly can expect serious spasms and dislocations throughout their organizations, accompanied by seemingly endless and expensive problems as a very powerful method of information processing arrives on the scene.

Those managers who do respond to the challenge, however, can wield the necessary influence to make the advent of cheap and readily available graphics systems a positive and profitable experience. ■

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MANAGEMENT

TAKING CHARGE
John Murray

Taking the pulse of MIS

When considering the mission of the management information systems function, it is usually assumed that the paramount aspect is to provide a sound technical environment. But this is not the case.

The salient aspect of the MIS mandate should be consistent delivery of a high level of service to all customers in the department. The associated technical considerations should be viewed as ancillary. Stated more directly, the goal of MIS should be service, achieved through the effective application of information processing technology.

As that technology improves and the number of opportunities grows for those outside the MIS department to do more information processing on their own, the pressure to provide a high level of customer service rises. Installations that ignore this will find themselves in an increasingly tenuous situation.

While the concept may be foreign to some of those charged with the delivery of MIS services, a marketing orientation is becoming, and will remain, an essential aspect of MIS work. The MIS department may deliver the finest technical products and services, but if its customers do not feel they are being

See **TAKING** page 95

Murray is director of management information systems at the American Breeders Service Division of W. R. Grace & Co. in DeForest, Wis.

Coke bottlers merge MIS

Job calls for training, conversion, integration

By James A. Martin

CHARLOTTE, N.C. — In the mid-1980s, the computer room has become almost as important as the board room in planning merger strategies.

During a 1985 takeover of Wometco Enterprises, Inc.'s Coca-Cola bottling division in Miami, Coca-Cola Bottling Company Consolidated looked to its MIS management team to bring consistency to the resulting computing chaos. The idea was that an integrated information system would, among other things, smooth out some of the rough edges created when fitting one company with another.

With the Wometco acquisition, Coke Consolidated nearly doubled in size overnight. Net sales almost tripled in fiscal 1985, rising to $340 million from $130.2 million in 1984. With eight plants, Wometco's Coca-Cola bottling operation was the seventh largest in the U.S. Operating in the Carolinas and Georgia, Coke Consolidated was the 18th largest Coke bottler in the country. The combined company now stands as the country's fourth largest Coke bottler.

Michael F. Johnson

The acquisition led to a tumultuous period for Coke Consolidated's MIS department that included a $5 million integration and conversion linking Wometco DP systems with Charlotte headquarters, the hiring of new staff, additional training and the extension of computer operations and support from five to six days a week.

The goal throughout was to obtain an information systems consistency, according to Michael F. Johnson, vice-president of Management Information Ser-

See **COKE** page 96

Cigna speeds DP with hired help

By David Bright

Although it was late getting into the group universal life insurance market, insurance carrier Cigna Corp. says it has come quickly up to speed by farming out the data processing operations of its new program.

To develop such a product and the accompanying data processing system can take as long as 36 months, but Cigna had the entire program up and running within eight months, says John Barber, director of employee marketing administration and customer service at the company's Bloomfield, Conn., office.

Cigna accomplished this by forming what Barber calls a triad with Cybertek Computer Products, Inc. in Los Angeles and Administrative Consultants, Inc. in Waterbury, Conn.

Administrative Consultants handles administrative functions such as payroll processing, while Cybertek supplies remote processing services on its IBM mainframe-based Cypros/AP real-time insurance processing system.

The program became usable in late August.

"Our game plan was to seek out a vendor or vendors that could support a quick product introduction into what we consider one of the premier marketplaces in the insurance business," Barber explains. "We didn't have a 36-month window. We had a very short, precise time

See **CIGNA** page 100

INSIDE

Calendar: Selected conferences, exhibitions, seminars/**90**

INSTANT ANALYSIS

"You cannot lay technology on top of existing [business] practices and expect it to make a big difference."

— Michael S. Scott Morton, professor of management at MIT's Sloan School

MANAGEMENT MEMO

Surveys foresee CIO demand, high turnover, increased PC use in 1987

Senior information systems executives will be in growing demand next year, reflecting interest in chief information officers, as will data processing staff in hot technical areas, according to a placement firm's annual forecast.

Demand for information systems executives "capable of participating in the corporate decision-making process" will grow, while demand for middle managers remains flat, according to Halbrecht Associates, Inc., a Stamford, Conn., executive search firm.

The trend reflects adoption of the chief information officer concept, according to Herb Halbrecht, president of the firm. Compensation for the jobs may top $200,000 a year and twice that on Wall Street, he said.

DP professionals in demand will include specialists in telecommunications, computer-integrated manufacturing and artificial intelligence, particularly expert systems applications, according to Halbrecht.

Demand for AI specialists has grown steadily since 1983 but has shifted from vendors to banks, telecommunications, manufacturers and other users seeking "knowledge engineers," he says.

Halbrecht projects demand for data center or computer operations managers, data base administrators and systems or applications developers to be strongest in banking and other transaction-oriented areas.

■

Average turnover of data processing staff will remain above 15% next year, as competition for trained workers continues and budgets for their salaries grow at the slowest pace in at least seven years, according to a firm specializing in compensation management.

Average salary growth for DP professionals will be about 6%, according to a survey of major employers by Edward Perlin Associates, Inc. in New York. Local rates are projected at a national high of 7.5% for New York and 5.5% to 6% for Boston and San Francisco.

The firm expects DP staff turnover rates of 17% in New York, 16% in Boston and a low of 7% to 8% in San Francisco. Companies reported individual turnover rates for this year ranging from 4.5% to 36.1%.

High turnover can boost corporate costs dramatically, says Perlin consultant Peter Tamblyn. With growth of salary budgets checked, some companies seek to stem turnover with benefits such as extra vacation, according to Perlin spokesman Roger O'Connor.

■

Most top executives at big companies do not use a personal computer, but many plan to start doing so within a year, according to a survey by Accountemps, the personnel service run by Robert Half International, Inc.

In a survey of vice-presidents and personnel directors at 100 of the country's largest companies, 61% said they do not use a personal computer at work or home. However, 28% of those executives said they plan to start next year.

The surveyed executives estimated that 35% of their companies' middle management executives use personal computers.

"It's surprising that executives, who know the value of computers, are failing to utilize them to boost their own productivity in management planning," said Accountemps Vice-President Marc Silbert. More executives will accept PCs as they become less intimidated by the technology and more aware of their benefits, Silbert said.

CALENDAR

DECEMBER 14-20

Seventh Annual Data Training Conference and Exposition. Washington, D.C., Dec. 14-18 — Contact: Conference Registrar, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

Conference on Information Systems. San Diego, Dec. 15-17 — Contact: Society for Information Management, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Advanced Manufacturing Systems-West '87. Anaheim, Calif., Dec. 15-17 — Contact: John Frett or Bill Harrington, Cahners Exposition Group, P.O. Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

Effective Management Skills for the MIS Manager. Chicago, Dec. 15-18 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Improving Your Internal Consulting Skills. Washington, D.C., Dec. 15-18 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Advancing Standards Technology for Distributed Information and Telecommunication Systems. Denver, Dec. 15-19 — Contact: Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180.

Fostering Creativity and Innovation. (Satellite Broadcast) Dec. 15-19 — Contact: National Technology University, P.O. Box 700, Fort Collins, Colo. 80522.

Microcomputer Graphics Show. New York, Dec. 17-19 — Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

Dexpo East 86 Show. New York, Dec. 17-19 — Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

JANUARY 4-10

Developing Effective Computer Documentation. Sunnyvale, Calif., Jan. 5-7 — Contact: Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

Hawaii International Conference on System Sciences. Kailua-Kona, Hawaii, Jan. 6-9 — Contact: Center for Executive Development, College of Business Administration, University of Hawaii, B-101, 2404 Maile Way, Honolulu, Hawaii 96822.

Fiber Optic Seminar. Chicago, Jan. 7-9 — Contact: The American Institute, 55 Main St., Madison, N.J. 07940. Also being held Feb. 4-6 in Washington, D.C.

Ten Unix Seminars. Fremont, Calif., Jan.7-10 — Contact: Uni-Ops, P.O. Box 27097, Concord, Calif. 94527.

JANUARY 11-17

Business Automation Forum. Fort Lauderdale, Fla., Jan. 11-14 — Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

Application Prototyping: Implementing the New Systems Development Technology. Boston, Jan. 12-13 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Feb. 19-20 in Philadelphia and Feb. 26-27 in Los Angeles.

Interfacing Sensors with the IBM PC. Madison, Wis., Jan. 12-14 — Contact: Department of Engineering Professional Development, University of Wisconsin at Madison, 432 N. Lake St., Madison, Wis. 53706.

Writing Better Software Documentation for Users. Santa Cruz, Calif., Jan. 12-14 — Contact: University of California Extension, Santa Cruz, Calif. 95064.

Moscon I. San Jose, Calif., Jan. 13-14 — Contact: Technology Forums, Suite F, 3425 Pomona Blvd., Pomona, Calif. 91768.

Efficient Fortran Techniques for Parallel Vector Processors. San Diego, Jan. 12-16 — Contact: Pacific-Sierra Research Corp., Suite 203, 312 Main St., Placerville, Calif. 95667.

Winter MAP/TOP Users Group Meeting. Phoenix, Jan. 13-14 — Contact: Society of Manufacturing Engineers, Technical Activities Division, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Managing and Motivating Computer Professionals. Stamford, Conn., Jan. 13-15 — Contact: Gary Slaughter Corp., 400 Fifth Ave. S., Naples, Fla. 33940. Also being held Feb. 10-12 in Washington, D.C.,/Baltimore and March 10-12 in Indianapolis.

Writing Procedures, Policies and Documentation. Orlando, Fla., Jan. 13-16 — Contact: Laurel Lewis, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154. Also being held Jan.13-16 in Somerset, N.J.

Computer Disaster Recovery Planning Seminar. Los Angeles, Jan. 14-16 — Contact: Devlin Associates, Inc., 430 Exton Commons, Exton, Pa. 19341. Also being held March 18-20 in Philadelphia.

Computer Graphics '87. San Diego, Jan. 14-16 .— Contact: Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

Data Administration and Data Resource Development. Dallas, Jan. 14-16 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held April 27-29.

The Society for Computer Simulation 1987 Multiconference. San Diego, Jan. 14-16 — Contact: SCS, P.O. Box 17900, San Diego, Calif. 92117.

See **CALENDAR** page 94

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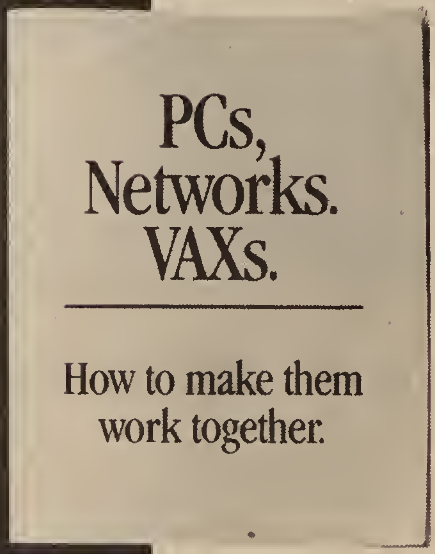
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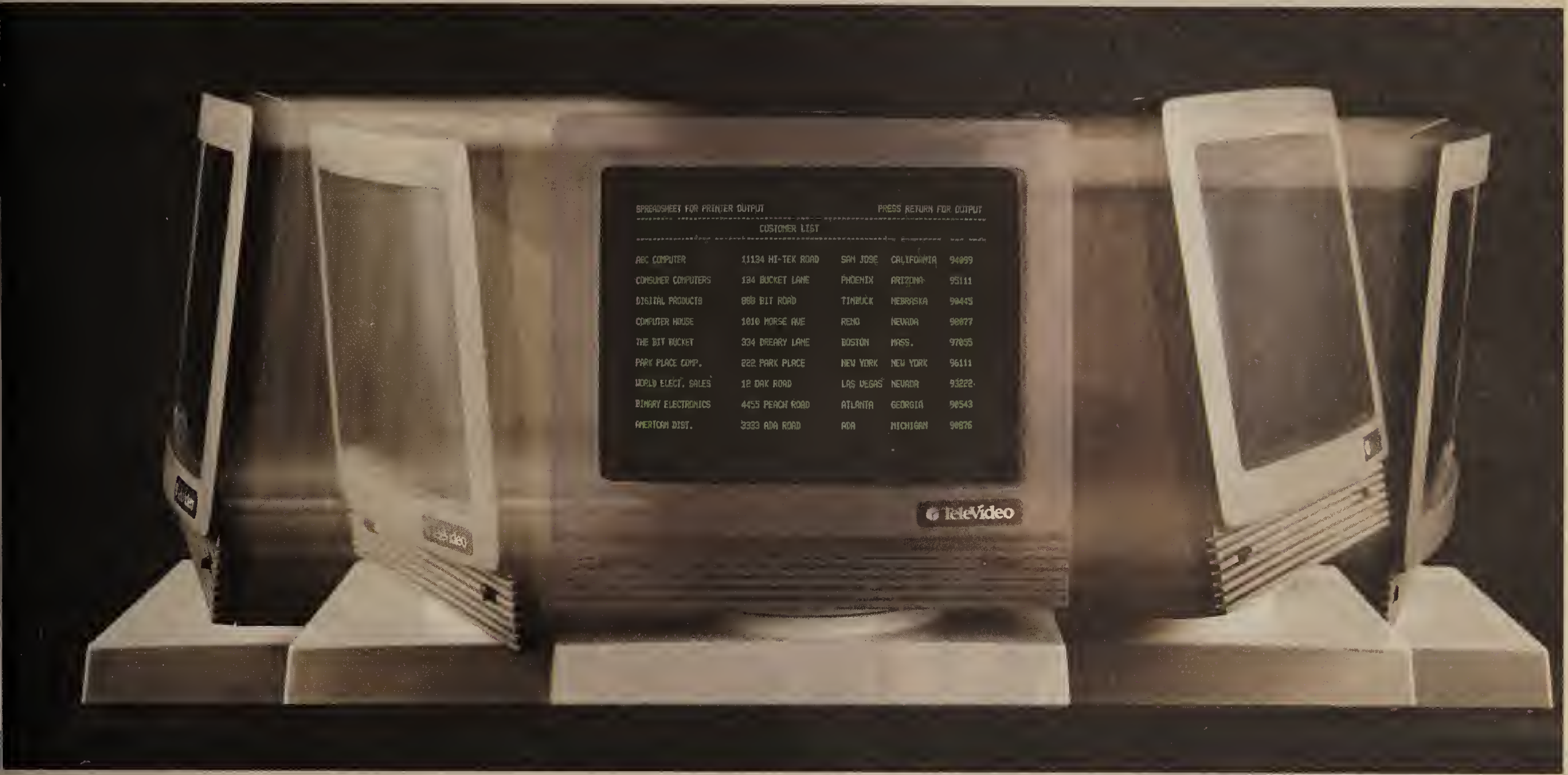

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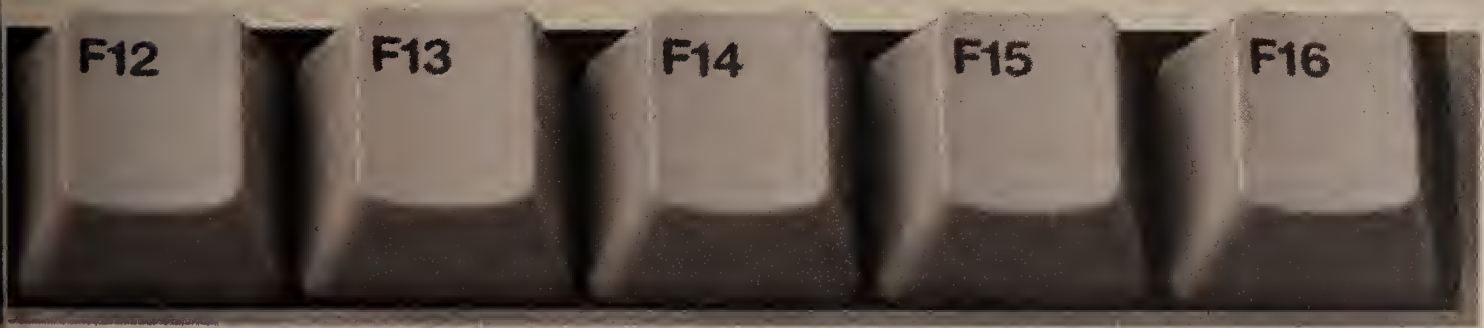

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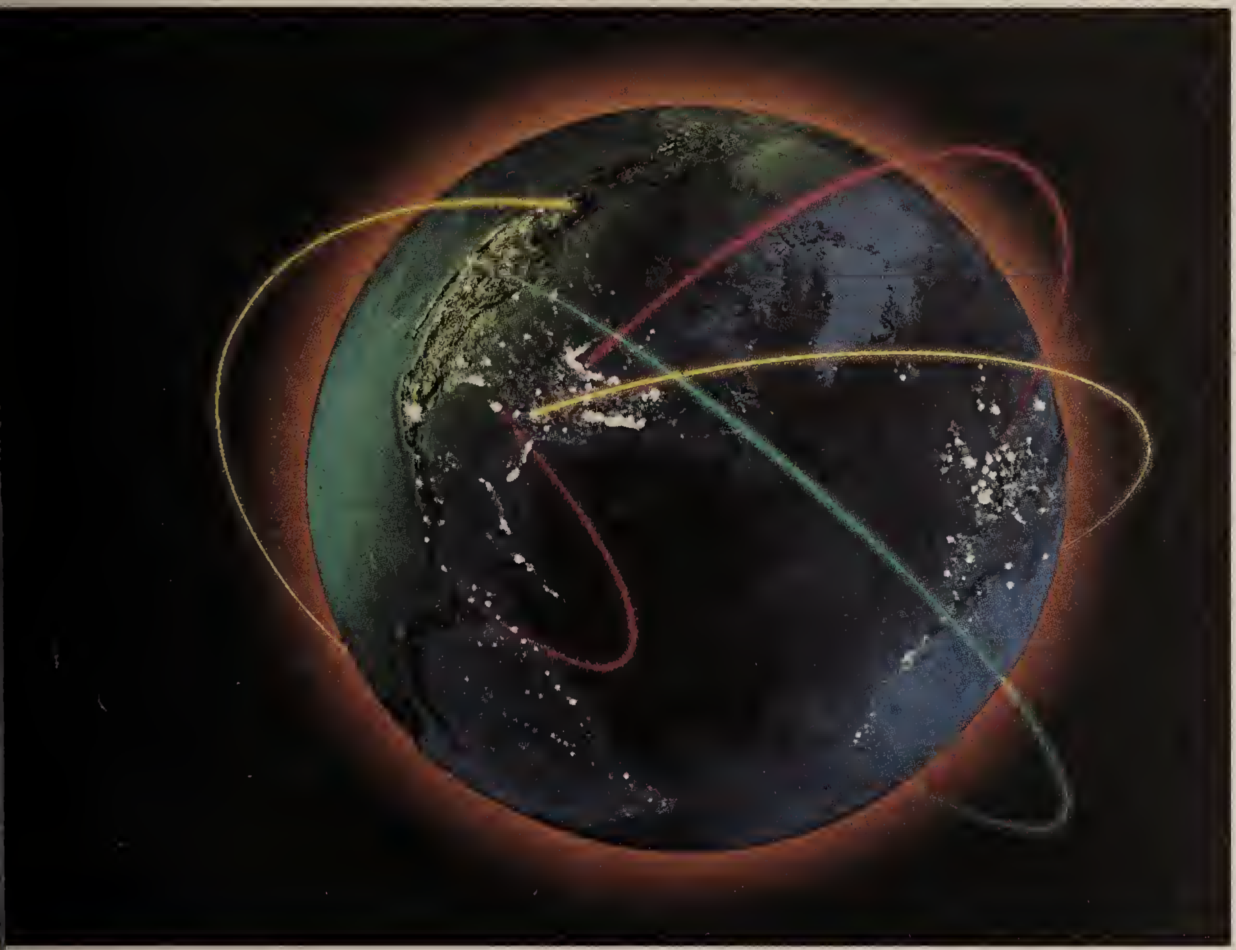

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- At USER NAME? type RIGHT.CONNECTION press CR.
- At PASSWORD? type TELEMAIL press CR.
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CALENDAR from page 90

Data Communications and Networking for the IBM PC XT/AT and Compatibles. New Brunswick, N.J., Jan. 15-16 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Feb. 5-6 in Los Angeles and Feb. 19-20 in Chicago.

Systems Engineering Management Plan. Orlando, Fla., Jan. 15-16 — Contact: Technical Marketing Society of America Seminars, Dept. SEMP, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

JANUARY 18-24

Pacific Telecommunications Council Ninth Annual Conference. Honolulu, Hawaii, Jan. 18-21 — Contact: PTC '87, Room 308, 1110 University Ave., Honolulu, Hawaii 96826.

Systems Engineering Workshop. Tampa Bay, Fla., Jan. 19-22 — Contact: M. Bryce & Associates, Inc., 777 Alderman Road, Palm Harbor, Fla. 33563.

Comlease Winter. New Orleans, Jan. 19-23 — Contact: The Information Exchange, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

Buscon-West. Los Angeles, Jan. 20-21 — Contact: The Bus/Board Users Show & Conference, No. 116, 17100 Norwalk Blvd., Cerritos, Calif. 90701.

Companywide Disaster Recovery Planning. Los Angeles, Jan. 20-22 — Contact: Devlin Associates, Inc., 430 Exton Commons, Exton, Pa. 19341. Also being held March 24-26 in Philadelphia.

Uniforum. Washington, D.C., Jan. 20-23 — Contact: Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

Dbase III and Dbase III Plus. New York, Jan. 20-23 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Feb. 9-12 in San Francisco and March 9-12 in Chicago.

Educational Seminar on T-1 Facilities and Networking. Dallas, Jan. 21-22 — Contact: Timeplex, Inc., 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675. Also being held Feb. 18-19 in Irvine, Calif. and March 18-19 in New Orleans.

Winter 1987 Technical Conference of the Usenix Association. Washington, D.C., Jan. 21-23 — Contact: P.O. Box 385, Sunset Beach, Calif. 90742.

The Open Network Architecture Concept. Washington, D.C., Jan. 22-23 — Contact: Telecom Publishing Group, Suite 444, 1101 King St., Alexandria, Va. 22314.

JANUARY 25-31

Entity Modeling: Techniques and Application. Chicago, Jan. 26-30 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Integrating Purchasing, Receiving and Accounts Payable Systems. Philadelphia, Jan. 26-30 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Mapper Installation, Coordination and Support. Dallas, Jan. 26-30 — Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

NCITD Informational Forum. New Orleans, Jan. 27 — Contact: Eugene A. Hemley, Executive Director, National Council on International Trade Documentation, Suite 1200, 350 Broadway, New York, N.Y. 10013.

Annual Conference on Improving Productivity in EDP System Development. Phoenix, Jan. 27-30 — Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

Computer Graphics New York '87. New York, Jan. 28-30 — Contact: Exhibition Marketing & Management, Inc., Suite 690, 8300 Greensboro Drive, McLean, Va. 22102.

Keeping U.S. Manufacturing Globally Competitive. San Diego, Jan. 28-30 — Contact: Robotic Industries Association, P.O. Box 3724, 900 Victors Way, Ann Arbor, Mich. 48106.

The Conference on Desktop Communications. San Francisco, Jan. 28-31 — Contact: The Seybold Group, Inc., 20695 Western Ave., Torrance, Calif. 90501.

Being More Profitable and Competitive with PC CAD/D. Sarasota, Fla., Jan. 30 — Contact: Maura Belliveau, Graphic Systems, Inc., 180 Franklin St., Cambridge, Mass. 02139.

FEBRUARY 1-7

1987 ABA Bank Telecommunications & Data Processing Workshop. San Diego, Feb. 1-4 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Instructional Computing Conference VII. Orlando, Fla., Feb. 2-5 — Contact: Florida Department of Education, Educational Technology Section, Knott Building, Tallahassee, Fla. 32399.

Third International Conference on Data Engineering. Los Angeles, Feb. 2-6 — Contact: The Computer Society of the Institute of Electrical and Electronics Engineers, Inc., 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Automated Clean Room Processes. San Jose, Calif., Feb. 3-4 — Contact: Robotics International of Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

The Third International Conference on Data Engineering. Los Angeles, Feb. 3-5 — Contact: Professor Gio Wiederhold, Stanford University, Computer Science Department, Marguerite Jacks Hall, Palo Alto, Calif. 94305.

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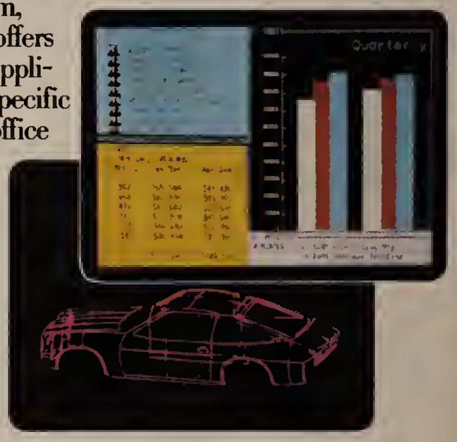

Taking the pulse of MIS

From page 89

adequately served, the department will find itself in an increasingly difficult position.

As with any marketing effort, a number of basic questions must be considered. Identifying groups of customers, or market segments, is first. Other important considerations are identifying the needs of the various segments and the relative importance of each group and its needs.

In order to improve customer service, two things need to happen: MIS must acknowledge the need to do so, and senior management must be willing to support the required effort.

Once the process begins, there are two key requirements. One is to provide factual information about the overall performance of MIS rather than isolated stories that may be partially based on emotion. The other is to compare the performance with that of other MIS installations. Stated rather simply, the issue is, "How are we doing . . . compared with what?"

Many MIS installations are doing a rather good job of satisfying customers. They need to establish what might be termed a baseline indicator. The idea is to identify what is being done well and where the problems are, then develop a plan to move up from the baseline.

Sometimes MIS departments will try to address the determination, monitoring and improvement of customer satisfaction through internal processes. While this may be deemed successful, it often falls short of stated goals. Some of the potential problems include the following:

- It is difficult to capture the attention and commitment of senior managers and MIS customers.
- The material used to develop facts — usually a questionnaire — is not sufficiently detailed or comprehensive, perhaps due to a lack of experience on the part of those who prepare it or a lack of senior management involvement.
- The questionnaire, if it originates in the MIS department, is subjective and worded to steer participants toward answers favorable to MIS.
- The work becomes too time-consuming for an in-house staff.
- There is no means of comparing the results with those of similar surveys of other organizations.

While the development of an in-house procedure can prove worthwhile, much more benefit can be derived from use of a consulting service that offers special assistance in this area.

As with selection of any outside service, care must be taken to select one that will work. Selecting a firm that has captured sufficient empirical data about its clients and developed a data base that can process that information can help address a number of "compared with what" questions and can do so based on criteria such as installation size, business segment and type of hardware.

What are the practical aspects of attaining such information? One is obvious: The information can be used to identify levels of MIS service relative to other organizations. These comparisons can then be used to refute or substantiate client departments' contentions about service levels. Another potential benefit is assistance in developing strategies for the organization.

An outside service should also provide help in determining how installations that have achieved high levels of customer satisfaction have done so and how they maintain those levels.

While the focus of the processes discussed here is on MIS, broader implications should not be overlooked. First, there is increasing recognition of the value of a high level of MIS performance to the entire business. Second, an MIS installation that has considered customer service on the basis of in-house clients and can transfer its understanding to the broader concern of the organization's outside customers might enhance the MIS department's contribution to the organization.

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as the largest computers in a business or as departmental computers in large companies. And to provide you with the communications and growth options your business needs, the System/3X family was recently enhanced to provide even smoother peer-to-peer communications, greater host and PC connectivity, and stronger networking with IBM 370 mainframes and PCs.

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All this technology is fascinating in its own right. But it just gives you more in terms of real mid-range computing options: growth upward to mainframes, highways between mainframes and PCs or other workstations—or flexible connections with networks and enhancements either from IBM or other manufacturers.

And integrated office solutions to meet your needs are available on both systems.

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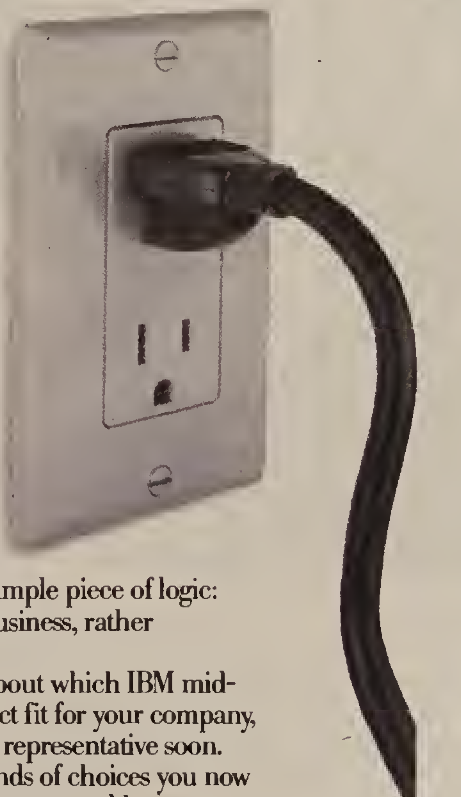

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Perhaps the best fit of all is the way IBM's mid-range computers fit into your working environment. The 9370s are very neighborly. With set-up times of under five hours and rack-mounted components that can be installed like stereo equipment. System/3X family members are simple to operate and fit in easily, too.

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A Fitting Conclusion

The reason IBM mid-range systems fit in so well is based on a simple piece of logic: they're built to fit your business, rather than vice versa.

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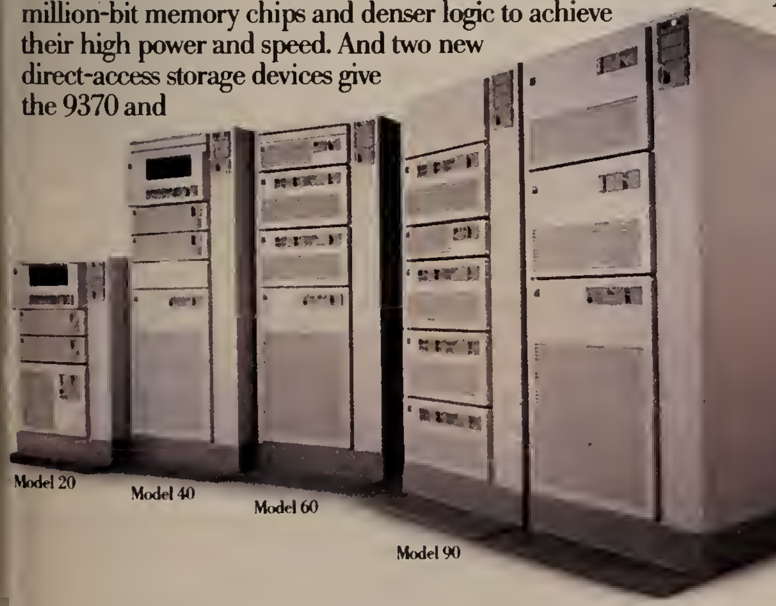

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TEXAS INSTRUMENTS

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Coke bottlers merge MIS

From page 89

vices at Coke Consolidated's new Charlotte office tower.

"The biggest focus for us during all of this was to develop some type of consistency and standardization from the DP standpoint," Johnson says. "We wanted to simplify our information, from the source up to management levels, with minimal human intervention. We wanted to be able to capture information from route drivers and case salesmen and flush it all the way up through the system."

In growing so rapidly, the key thing was to get good information, and that required integrating the various systems the company depended on, Johnson says. Such integration requires a dedicated, flexible staff that can handle new systems while still maintaining existing ones at optimum levels, he adds.

Coke's W. Lee West

At the time of the acquisition, Wometco had eight bottling operations, four of which Coke Consolidated sold. Wometco compiled its sales figures on an IBM 4341 mainframe running DOS/VSE in Miami. Three of the divisions that the bottling company kept had Motorola, Inc.'s Information Systems IV/90 S minicomputers, while the Mobile, Ala., operation used NCR Corp.'s 8430 Model 5360 minicomputer.

Coke Consolidated ran its sales, payroll, accounts payable and other systems on a Sperry Corp. 9030 bought some 10 years earlier. It also operated at headquarters an IBM System/38 Model 4 for general ledger, accounts payable and payroll and three IBM System/36 B26s at its three field bottling divisions that performed standalone processing but transmitted sales reports to Charlotte.

The System/36 was the focal point around which the integrated DP system was built, according to W. Lee West, manager of technical support. Because there were System/36s already in place, MIS decided to use the 36 as the standard for its seven field offices.

Coke Consolidated acquired an IBM 4361 Model L03 running DOS and moved all Sperry and System/38 data bases and processing to it by July 1985. With an eye to expansion, MIS also purchased an IBM 4381 Model P02 as its main processor to run the MVS/XA operating system. In October, MIS installed McCormack & Dodge Corp.'s Millennium General Ledger and Accounts Payable on the 4381 with the intent of consolidating corporatewide sales and financial data.

Abandoning Sperry to go with IBM was "a nondecision," according to West. "We were headed in that direction anyway," he says, explaining that the MIS department was largely IBM and the 10-year-old Sperry machine lacked power.

Because of the merger, the company had "a hodgepodge of systems" and no consolidated way to report sales, so it acquired McCormack and Dodge packages and the 4381 to run them, Johnson says. "Since we were also moving to newer, larger headquarters, we decided to get rid of the Univac and keep the old systems on the DOS machine with the idea of eventually moving them all to MVS/XA, because that is where everything seems to be growing," Johnson observes.

The company acquired Cullinet Software, Inc.'s IDMS-DC and IDMS/R relational data base for the 4381 to collect sales information from the field. The strategy was to provide top managers with the best possible information to support their marketing and operations decisions, Johnson says.

"With this new system, senior management can look at sales information by location, brand name, package and by customer. They can get this from the corporate data base without having to tax the field people to come up with these reports," he notes. Top executives see the data through printouts, not terminals.

The System/36s in the field collect sales data transmitted via modem and leased lines to an IBM 3725 front-end processor attached to the 4381, where it is compiled on the IDMS/R corporate data base. "With this system, at any point in time, you're able to see what the sales activity was for the previous day, the year to date for a particular customer. To the best of my knowledge, we're the only Coke bottler that really has such a system in place," Johnson claims.

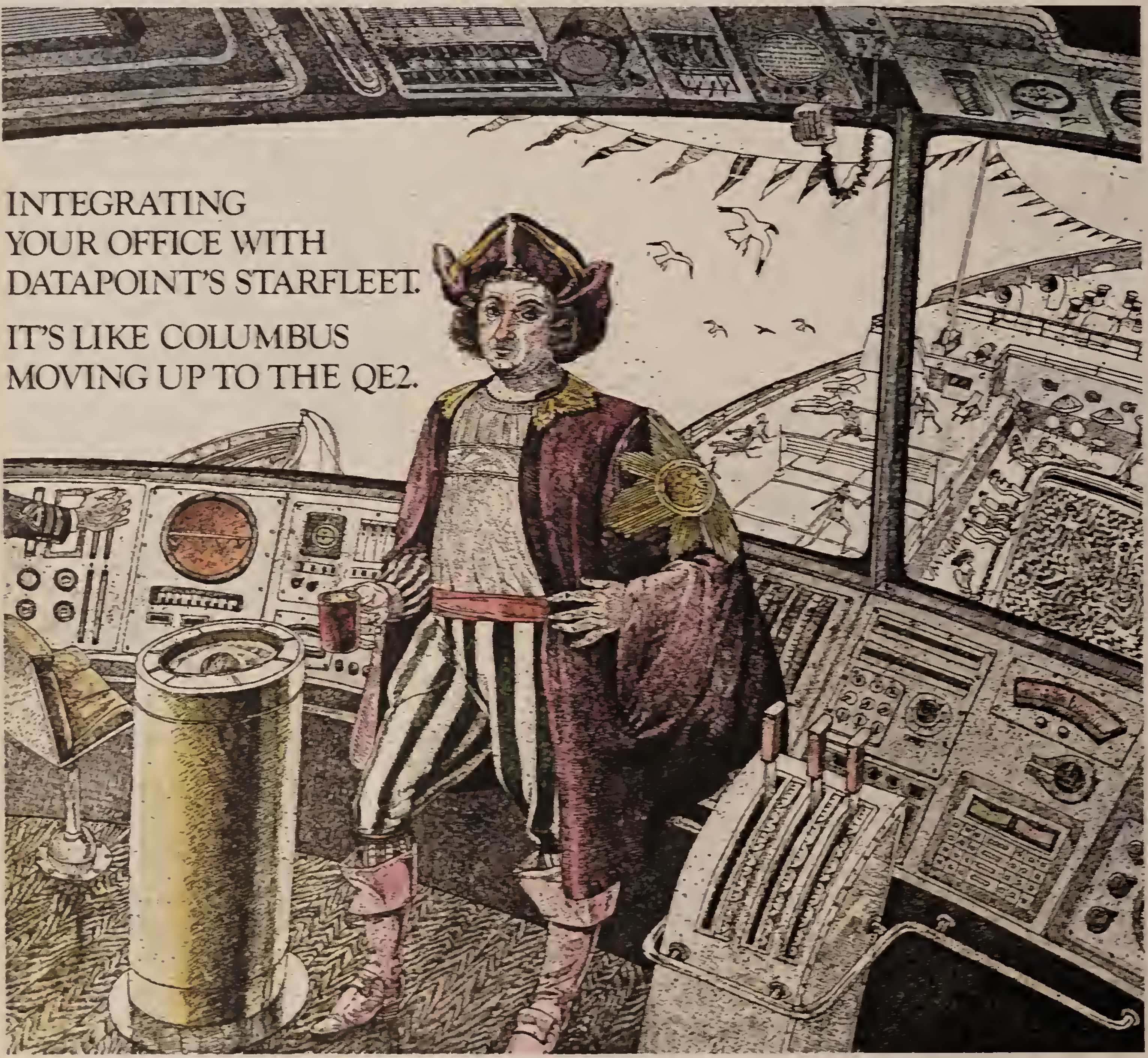
DP needs grew overnight

As the company grew overnight, so did its DP needs. MIS hired 10 to 15 additional people, most of them for operations. Computer operations were extended from the traditional Monday-to-Friday, 40-hour workweek to Monday to Saturday, 24 hours a day. Four operators now work 12-hour shifts three days a week and are off four days. Additional support staff work eight-hour shifts.

That schedule covers more territory with fewer people, according to Thomas M. Bonnell, manager of operations. "Before, I had to worry if I needed someone on a Saturday," he says. "Now I have ease of mind knowing someone will be there. I've been able to eliminate a lot of overtime this way."

Many DP operators initially had

See **COKE** page 100



When it comes to large scale departmental computing, many vendors simply don't know the devil from the deep blue sea.

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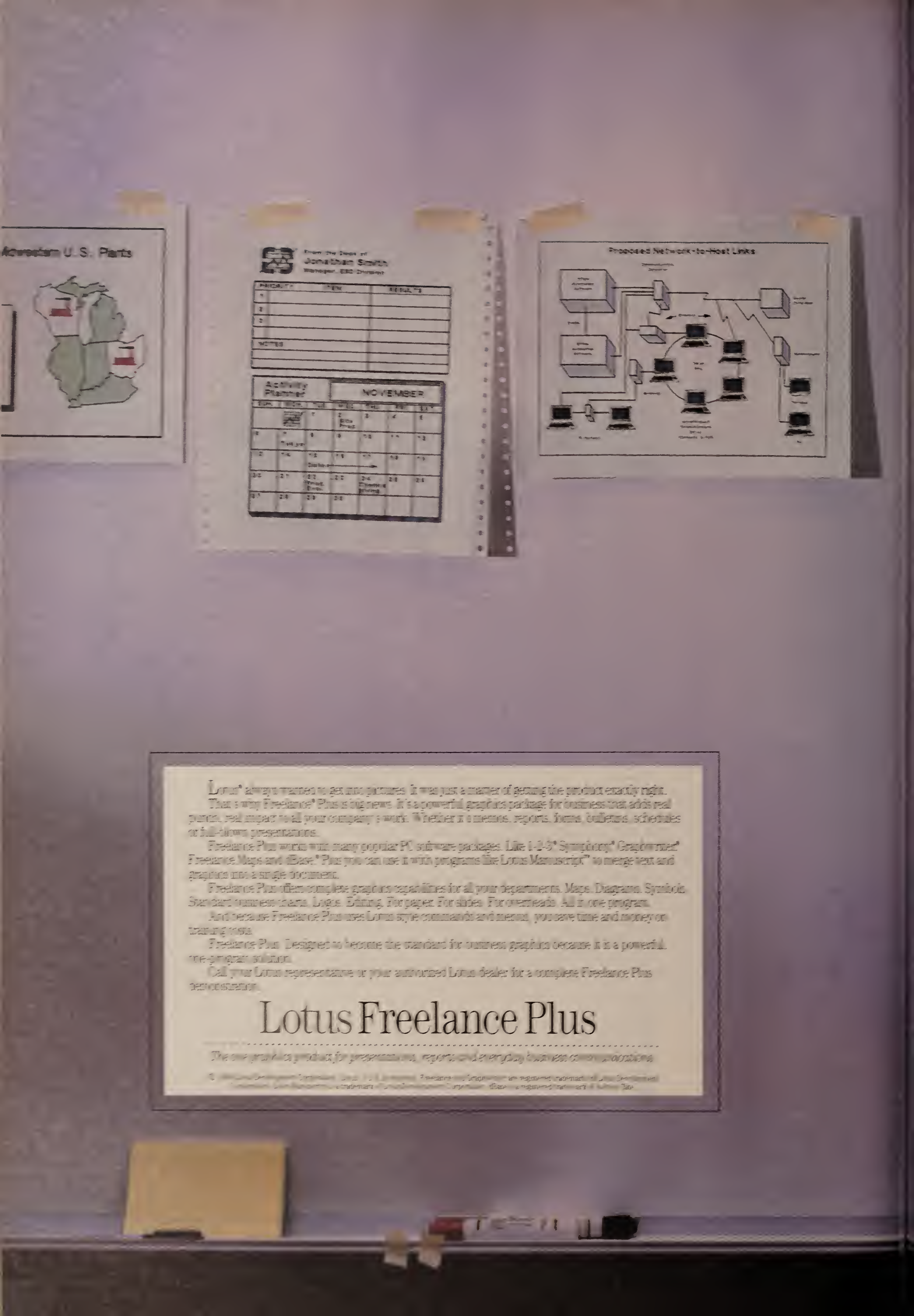

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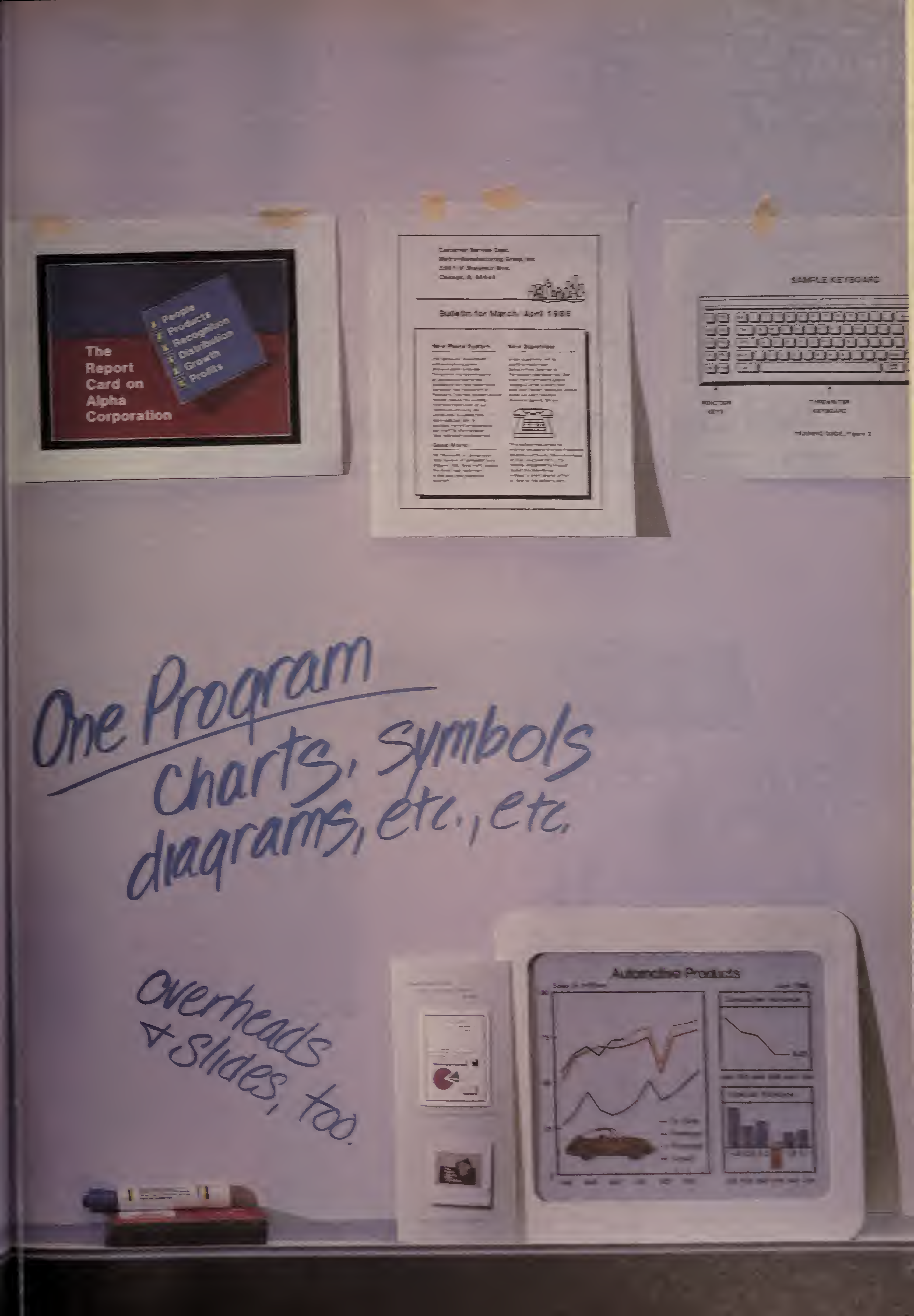
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Coke bottlers merge MIS

From page 96

doubts about working long shifts, but most now enjoy the extended weekends. Plans are to maintain operations seven days a week early next year.

Because both DOS and MVS/XA environments are currently being supported, all DP operators and staff had to know how to run both systems, Bonnell says. Operators were trained and computer schedules and code sheets were provided as guides. "You've got to keep operations as easy as possible, and we saw this as the only way to be successful," he adds. Plans call for eliminating the 4361 DOS machine once everything is up on the 4381.

Although the conversion projects have run smoothly, Johnson admits there were some aspects he would now handle differently. "I would like to have brought everyone from the field to one spot and gone over the whole strategy from the DP standpoint so everyone would be aware of what we were doing. At times, I think field people felt we were imposing things on them just for the sake of automation. We probably didn't do as good a job as we should have in explaining what we were trying to achieve," he contends.

Taking a breather

MIS plans to install production scheduling, human resources, payroll and manufacturing systems on the 4381, but not before a breather. "We've done a lot, and there's still a lot left to do," Johnson says. "We're now going through a digestion period. At some point, you have to slow down and get used to it all before you can proceed."

Technology aside, it is the staff that makes such cumbersome conversion and updating projects work, according to Bonnell. "Our staff has been put through a lot of trauma, and they've come through it all quite well," he says.

Interestingly, most of the top MIS managers had worked together before coming to Coke Consolidated, Bonnell adds. "It's funny that we all ended up together like this," he says. "It helped that we had all worked together, because everyone knew how everyone else performed and we didn't have to go through the 'getting-to-know you' period."

Cigna speeds DP with hired help

From page 89

frame to work on."

To market its group universal life program to corporations, Cigna uses personal computer software designed by Cybertek for three applications: product modeling, sales and production. Its sales people use portable computers to give presentations to groups of 20 to 30 people, Barber says. "We can generate customized illustrations and enrollment forms with the micro software," he explains. To allow customers to make what Barber calls educated purchases, the software is used to figure in variables such as employee contributions, policy length and cash value.

Before a presentation, the Cigna sales workers load employee information onto floppy disks. "They already have the data base established, so all they have to do is enter in the social security number of the individual and the displays come up," Barber says. "The individual sitting there can choose a different option, a different contribution or a different factor times earnings."

Because of Cybertek's broad range of insurance products and support, Cigna also has many options, Barber notes. "In the group business, the market requires us to be very flexible and have the ability to do whatever our clients want us to do," he explains.

For example, if an employer wants to do the enrolling, Cigna can supply the company with training materials. "We don't have to do a lot of systems modifications because Cybertek's systems support advanced types of insurance products very well," Barber adds. Other Cigna offerings tied to the Cybertek system include variable group universal life, a medical expense program and an indemnity product or a disability product.

Barber is not sure on which portable computers the operation will standardize but says that a Toshiba Corp. model has been effective so far. He says customers are very receptive to the Toshiba system because of its small size and easy-to-read screen. "The fear factor is reduced," he declares.

Cigna's group life insurance applications are hosted by an IBM 3083 mainframe in Northbrook, Ill. Because of a distributed processing capability built into the operation, Cigna has the option of electronically submitting policy enrollment information from the employers' locations so the system can more quickly issue enrollment certificates. Cigna can also issue a certificate at the work site. However, the company usually uses the normal 60- to 90-day implementation time to fine-tune the policy, Barber says.

Using outside data processing contractors should enable Cigna to compete with companies such as Metropolitan Life Insurance Co. and Aetna Life & Casualty Co., which offered group universal life programs before Cigna. "We were late into the field, but I think we've rebounded satisfactorily," Barber contends. Within 10 months, he says, Cigna developed the product, put it on the system, got its sales people up to speed and sold 10 policy packages to employers.

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NEW PRODUCTS

Transfer system ties PC users to E-mail center

An electronic message system for remote and local correspondents was unveiled by Purvis Systems, Inc., based in San Diego.

The Purvis Pipenet is a microcomputer-based store-and-forward electronic process transfer system, a company spokesman said. Personal computer operators around the country can call the stand-alone hub system over standard or dedicated telephone lines and check their individual mailboxes to send and receive executable programs or data files, the spokesman said. A single file can be sent to many mailboxes with one command.

The hub of the system, which manages the electronic traffic and stores messages, runs Unix system software that can be adapted to many mini and mainframe systems, according to the vendor. Minimum configuration is an IBM Personal Computer AT-class machine with 640K bytes of random-access memory (RAM). At least 20M bytes of hard disk storage is recommended.

The host software is priced at $700, plus $700 for a multiplexer board that can accommodate as many as eight callers simultaneously at transmissions ranging from 300 to 19K bit/sec.

The software for the remote operators runs on IBM PCs and compatible systems with at least 384K bytes of RAM and a Hayes Microcomputer Products, Inc.-compatible modem. Licenses for up to 20 packages are $600 each, with volume prices for greater numbers, the vendor said.

The number of remote sites is limited only by the hub system's hardware. A PC AT can accommodate about 50 mailboxes, and Purvis has successfully tested systems accommodating as much as 250M bytes of stored electronic mail and files, the vendor added.

A Pipenet system can also be used to link remote local-area networks as well as individual workstations. The mail system includes a built-in editor to the individual workstation software through which any ASCII file can be transmitted.

Gateway links LAN, minis

Token-Ring network, System/34, 36, 38 served

CXI, Inc. in Palo Alto, Calif., has introduced its 5250 gateway, called the PCOX/GW-5250.

The gateway is said to provide connection of an IBM Token-Ring network or other IBM Netbios-compatible local-area network (LAN) to an IBM System/34, 36 or 38 minicomputer.

It also reportedly allows LAN-attached personal computers to function as IBM 5250 display stations or as host-addressable printers.

Emulates 5251 display station

The PCOX/GW-5250 emulates a remote IBM 5251 Model 12 display station operating via a Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) link.

In addition, the gateway is said to support concurrent emulation of a combination of up to nine host display and printer sessions.

As many as five of the nine sessions may be accessed concurrently from a single personal computer that is situated on the LAN.

Multiple 5250 gateways may be installed on the same LAN to provide access to more than one host.

According to the vendor, because the PCOX/GW-5250 is connected to the host via a synchronous modem, a gateway-equipped LAN may be located in the same room as the minicomputer or wherever telephone service is available.

The 5250 gateway operates with existing host software.

Supports file transfer facility

The PCOX/GW-5250 also supports an optional file transfer facility for uploading and downloading data between the PC and the host.

The PCOX/GW-5250 package includes the SDLC adapter board, gateway software and user documentation, according to the vendor.

Four PCOX/GW-5250 workstation software kits are also included.

The PCOX/GW-5250 is priced at $1,725. Additional workstation software kits cost $200 each.

IMS data retrieval system enhanced: faster query response, fewer I/O calls

Sterling Software, Inc.'s Dylakor Division, based in Granada Hills, Calif., has announced an enhanced release of Dyl-Inquiry, an on-line data retrieval system said to provide immediate response to queries against IBM IMS data bases.

According to a company spokesman, among the most significant enhancements are two changes in the format of the system data base, resulting in faster response time to user queries as well as enhanced performance.

The changes consist of the addition of a high-level index that requires fewer I/O calls to locate directories and the addition of a bit-map block to keep track of free space in the system data base.

Improvements to the product's utilities have also been made, the spokesman said. The Iigen utility can now be run as a batch message processing job as well as a batch job, and a new parameter in the delete statement causes the entire specified transaction to be deleted, according to the company spokesman.

In addition, a new parameter causes all the fields of a segment to be excluded from a directory, and a function that produces a statistics report on the system data base now reports the last three users who have modified a stored inquiry, displaying the dates and times of the modifications, the spokesman added.

Another addition to the software is a command, PDL, that instantly displays a given logical terminal's characteristics.

Release 4.4 of Dyl-Inquiry is priced at $40,000. It replaces Release 4.3.

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```
                IBM
printf("Hello, world\n");
              ^
```

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SOFTWARE & SERVICES

Systems software

Help/38 Systems, Inc. has announced **Autotune**, a package said to provide automatic and continual tuning for the IBM System/38.

According to the vendor, the system allows users to customize tuning according to the customer's use patterns and preset priorities. Autotune moves memory where and when it is needed. It monitors system use at any specified time level and then adjusts memory pools and activity levels accordingly.

Autotune costs $1,450 per CPU.

Help/38 Systems, 210 Baker Technology Plaza, 6101 Baker Road, Minnetonka, Minn. 55345.

Executive Software, Inc. has announced **Diskeeper**, an on-line disk defragmenter for Digital Equipment Corp. VAX VMS environments.

Diskeeper is said to run as a detached process, defragmenting disks by converting fragmented files to contiguous ones and consolidating spaces on the disk. According to the vendor, no system manager intervention is required.

Diskeeper is priced at $750 for the DEC Microvax, $1,500 for the VAX-11 series and $2,500 for the VAX 8000 series.

Executive Software, 5537 Tuxedo Terr., Los Angeles, Calif. 90068.

■

Pyramid Technology Corp. has introduced the **Pyramid Cobol Development System** for its line of Unix-based superminicomputers.

The Cobol development system consists of a native Cobol compiler, a source-level debugger and a Cobol runtime system. It allows Cobol-based applications developed on personal computers and minicomputers to run on Pyramid's systems.

The Development System for Pyramid's Workcenter costs $6,000; it costs $8,500 for the vendor's 90 and 98 series superminicomputers.

Pyramid Technology, P.O. Box 7295, 1295 Charleston Road, Mountain View, Calif. 94039.

■

Vision Technology has announced **Basecad**, computer-aided dispatching software designed specifically for fire and emergency medical service communications centers.

Basecad runs on the Hewlett-Packard Co. HP 3000 line of computers and is said to allow call takers and dispatchers to enter calls, dispatch units, monitor status of units and calls and perform a variety of administrative functions.

A separate color computer display presents the status of units and calls in progress.

A turnkey system is priced from $70,000.

Vision Technology, Suite 415, 1760 Reston Ave., Reston, Va. 22090.

■

Signal Technology, Inc. has announced **Version 6.0** of its **Interactive Laboratory Systems** (ILS) for Digital Equipment Corp. VAX VMS environments.

Version 6.0 is said to offer expanded support for data acquisition and color graphics, an improved user interface and multiwindow operation on Vaxstations.

Version 6.0 of ILS will be sent free of charge to ILS VAX VMS customers on maintenance. ILS prices range from $5,100 to $19,800.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

■

Lawson Associates, Inc. has unveiled **Release 4.0** of **Multiclaim**, its health care claims administration system for IBM and Unisys Corp., formerly Burroughs Corp., mainframes.

Release 4.0 includes Multiclaim's four modules: medical, dental, disability and supplemental reports. The medical module is said to handle benefit plans without diminished examiner productivity. The dental module includes orthodontic claim detail inquiry, preauthorization claim listing and claim detail exception reports. The disability module includes explanation of benefits status maintenance and parameter display.

Three reports have been added to the supplemental reports module — diagnostic related group savings report, group experience report and referral report. The medical, dental, disability and supplemental reports modules cost $90,000, $30,000, $20,000 and $5,000, respectively.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

■

Uccel Corp. has enhanced its **UCC-7** automated production control system for IBM MVS and MVS/XA environments.

Added features include data base transportability, virtual terminal support and dynamic JCL allocation features. UCC-7 is said to maximize system throughput by automatically scheduling, releasing and managing work throughout the various areas of the data center.

It adjusts work submitted to the system according to available system resources, schedules and processing priorities.

UCC-7 is priced from $45,000 to $68,000.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

■

Hewlett-Packard Co. has announced the **Plastics Advisor**, a man-

Continued on page 103

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ufacturing software package for its HP 3000 family of business computing systems.

The software consists of seven operational and eight financial modules for machine-paced, made-to-order operations.

The integrated modules are said to offer functions of production and inventory planning.

The Plastics Advisor manufacturing unit starts at $28,300 and includes seven operational modules. Plastics Advisor's eight financial modules cost $15,200.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Applications packages

J. D. Edwards & Co. has announced **World Payroll** for the IBM System/38.

World Payroll is said to integrate with the vendor's World Accounting, including Job Cost Accounting and World Distribution. Features include unlimited deductions and benefits and the ability to process union payroll, automate multiple direct deposits to employee bank accounts, automate bank reconciliations and generate management, operations and government tax reports.

World Payroll costs $25,000.

J. D. Edwards, 4949 S. Syracuse St., Denver, Colo. 80237.

■

Syntactics Corp. has announced the **Crystal Publishing System**, designed for the creation of typeset-quality documents on Unix-based systems.

The package is said to merge the vendor's Crystalwriter Plus word processing software with its Crystaltypeset typesetting package. System features include soft-key commands, multilevel, context-sensitive Help and an object-based design for automatic formatting.

It will also accept bit-mapped images from other sources and incorporate them into documents.

The package costs from $895 to $12,995.

Syntactics, Suite 145, 3333 Bowers Ave., Santa Clara, Calif. 95054.

■

Unify Corp. has announced **Accell IDS 1.3**, a product update for its Accell integrated development system application development software.

The update includes 10 new language statements, enhanced automatically generated menus, more flexible screen design, data dictionary enhancements that include additional methods to enforce referential data integrity and performance and memory optimizations. Accell IDS 1.3 also includes 10 new software ports.

Accell IDS 1.3 is priced from $4,500 to $95,000.

Unify, 4000 Kruse Way Place, Lake Oswego, Ore. 97034.

■

Basis Software, Inc. has announced **Listings Advantage**, multiuser software products designed for real estate brokers.

The software is said to allow brokers to match prospect with properties, generate customized management reports, create prospect mailings, keep up-to-date owner and agent files and produce divisional or consolidated activity reports.

Features include security, Help, offer tracking, history file capabilities, personal computer downloading and word processing and commissions-accounting integration.

Listings Advantage runs on the IBM System/36. Total system costs, including hardware, range from $18,000.

Basis Software, Suite 702, 37 W. 57th St., New York, N.Y. 10019.

Utilities

Design Consultants, Inc. has announced **Starpro**, a support tracking and review product for IBM mainframe environments running IBM's CICS or TSO.

Starpro is said to be a feature for the vendor's Project Monitor project management system. It allows the user to automate support functions such as service requests, problem reports and change requests. Starpro can automate the manual logbook, paper routing and searches for service requests and their status.

Starpro costs $8,600.

Design Consultants, Suite 226, 100 Progress Pkwy., St. Louis, Mo. 63043.

■

Symark International, Inc. has announced **Release 7.0** of **CMA-Spool**, a remote print management system for VTAM networks.

Release 7.0 is said to provide an IBM ISPF menu system, which gives users control of their remote printers through a single keystroke interface. The product also features dynamic network group definitions and enhanced data compression.

CMA-Spool features report archival, an application call facility, compression and shared printers in generic communications environments.

CMA-Spool is priced from $10,000 to $15,000.

Symark International, Suite 704, 5655 Lindero Canyon Road, Westlake Village, Calif. 91362.

■

Triangle Software Co. has announced the **JCL-Neat** utility, said to reformat OS/VS JCL into a standard, consistent format.

The input JCL may come from a sequential input stream, a partitioned data set with many members, such as SYS1.PROCLIB, The Librarian or Pansophic Systems, Inc. Panvalet

Continued on page 107

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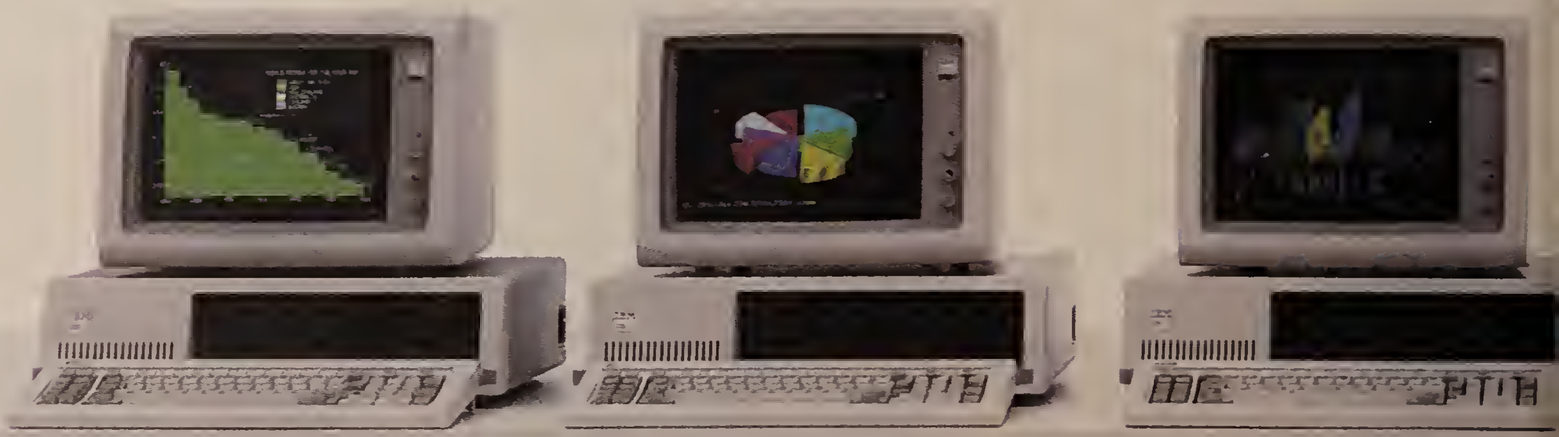

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Continued from page 103

source management library or by exits specified by the user and called by the JCL-Neat program.

Features include default options for starting, ending and continuation columns, keyword order and comment alignment and runtime parameters to override these defaults. Three reports are available.

JCL-Neat is priced at $2,500.

Triangle Software, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

■

Whitesmiths Ltd. has ported its Version 3.0 C and Pascal **cross-compilers** for the Digital Equipment Corp. VAX to PDP-11 computers.

According to the vendor, the compilers are said to support the development of free-standing programs or programs to be hosted under RSX-11 using the standard DEC assembler and linker.

Features include a C language source-level interactive debugger with break-pointing and variable display, enhanced support for read-only memory code and improved code generation.

The compiler also produces compiler and assembler source listings.

The Version 3.0 PDP-11 C cross-compiler is priced at $3,000. With the Pascal compiler included it is priced at $3,500.

Whitesmiths, 97 Lowell Road, Concord, Mass. 01742.

■

Numerical Algorithms Group, Inc. has announced the release of **Mark 12** of the **Nag Fortran Library**, featuring 175 new user-level routines including 97 new routines to enhance performance of the Nag Fortran Library on vector and parallel computer systems.

According to the vendor, Mark 12 is said to supply a range of supporting routines for commonly occurring scalar, vector and matrix-vector operations of linear algebra including Level 1 and Level 2 Basic Linear Algebra Subprograms.

The NAG Fortran Library is priced from $975 to $2,275.

Numerical Algorithms Group, Suite 100, 1101 31st St., Downers Grove, Ill. 60515.

■

Packet/PC, Inc. has announced **Commpress**, a file compression-decompression system for use with IBM-compatible micro-to-mainframe file transfer systems.

Commpress is said to provide compression algorithms that reduce text files by half.

According to the vendor, attributes of the system include execution either automatically within a TSO or CMS Command List, IBM CICS program or by operator command and reduction of files for transfer between the microcomputer and mainframe in either direction.

The Commpress system processes both text and binary files and will perform ASCII or Extended Binary Coded Decimal Interchange Code translation if needed.

The CPU license is priced at $5,000.

Packet/PC, Suite 103, 270 Farmington Ave., Farmington, Conn. 06032.

BMC Software, Inc. has announced **Data Packer/Fast Path**, an add-on feature to BMC's IMS data base compression product.

The feature is said to use Data Packer's Character Compression option to reduce Fast Path data from 30% to 50%.

The product is installed and used while IMS is running. Data compression can begin immediately upon installation of the add-on feature, according to the vendor.

Other attributes of the product include data integrity checks as well as a batch interface and provisions for the unique characteristics of sequential-dependent segments.

Data Packer/Fast Path is priced at $15,000 as an add-on feature. Data Packer is priced at $25,000.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77487.

Data Translation, Inc. has introduced the **Graphlib-VMS** software package, said to provide support under the Digital Equipment Corp. Microvax II for its DT2750 color raster graphics board.

The Graphlib-VMS package is said to allow users to generate and display mixed graphics and alphanumerics from a language such as Fortran or C.

According to the vendor, it consists of the Intrinsic library, which provides direct control over the vector generator and the character generator, and the Core library, which provides functions such as software scaling, clipping, polygon filling and commands for drawing lines, circles and axes.

Graphlib-VMS is priced at $895.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

CMI Corp. has announced **Serix/C Version 2.0**, an upgraded version of its C compiler for the IBM Series/1 EDX operating system.

Version 2 offers a resident, re-entrant runtime library said to reduce the size and linkage time of compiled C programs. Use of the resident runtime library reduces development time as library modules are not linked to the object modules, so link editing is faster.

The initial license fee is $8,200.

CMI, 2600 Telegraph Road, Bloomfield Hills, Mich. 48013.

Data base management systems

Informix Software, Inc. has announced **Version 2.1** of **Informix-SQL** and **Version 1.1** of **Informix-**

Continued on page 108

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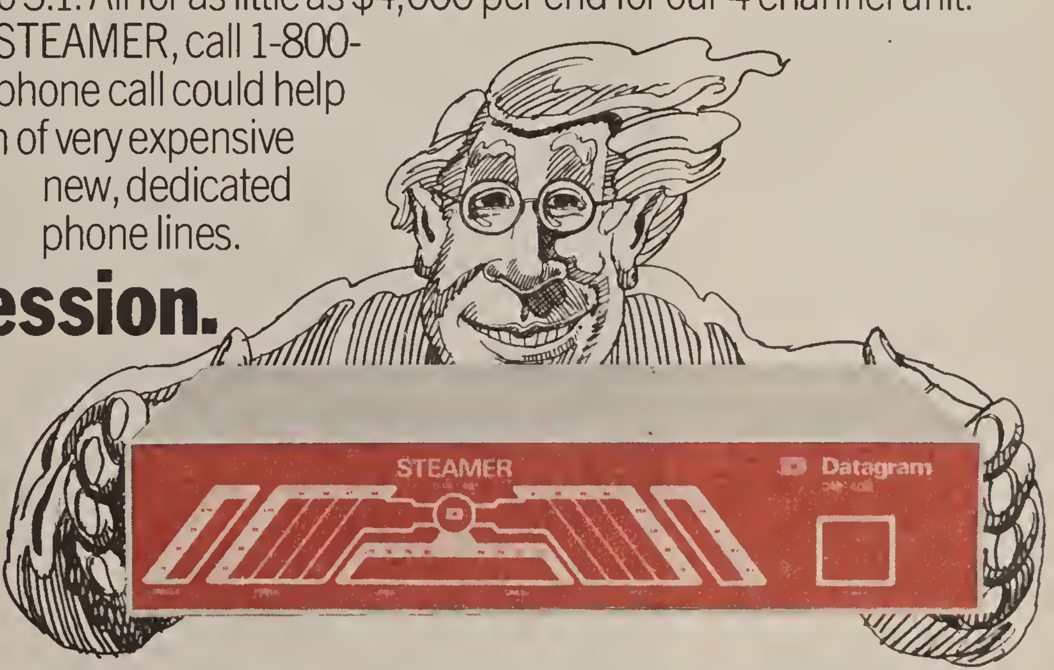

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Continued from page 107

4GL for Unix, Microsoft Corp. MS-DOS and Digital Equipment Corp. VMS.

Informix-4GL Version 1.1 includes windowing features. Both products include data clustering and autoindexing as well as query optimization, an SQL interface that is transparent to the application developer.

Informix-SQL is a relational data base management system based on SQL. Informix-4GL, also based on SQL, is a fourth-generation application building language.

Informix-4GL is priced from $995, and Informix-SQL is priced from $795.

Informix, 4100 Bohannon Drive, Menlo Park, Calif. 94025.

■

Information Dimensions, Inc. has announced the availability of **Basis** from Battelle Development Corp. on Digital Equipment Corp. VAXs running Ultrix-32 and on the DEC Microvax II running Ultrix-32M.

Basis is a full-text, modular data management system. The software for the VAX line requires standard C and Fortran compilers in addition to the Unix operating system.

The VAX version, priced by modules, starts at $15,200; the Microvax II version includes all 11 Basis modules for $17,250, according to the vendor.

Information Dimensions, 655 Metro Place S., Dublin, Ohio 43017.

MICROS

Systems

Compaq Computer Corp. has added **Models B, C** and **D** to its line of **Loral 3100T Compaq Portable 286** portable personal computers.

The Tempest certified personal computer features 640K bytes of random-access memory, a removable 20M-byte fixed disk drive, an internal fixed-disk tape backup and an Intel Corp. 80286 microprocessor.

Model B comes with a 1.2M-byte diskette drive. It costs $12,399.

Model C comes with one 360K-byte diskette drive and costs $11,999.

Model D comes with a 360K-byte diskette drive and an Intel 80287 math coprocessor. It is priced at $12,399, the vendor said.

Compaq Computer, 20555 FM149, Houston, Texas 77070.

Software applications packages

Computer Associates International, Inc. has added **Sales Analysis** to its Easybusiness Systems accounting family.

Sales Analysis is said to be a decision support tool that allows access to information needed in monitoring and planning sales activity.

The product automatically retrieves data from any or all of the Easybusiness Systems Order Entry, Accounts Receivable and Retail Invoicing modules to produce statistics, detail and summary reports.

Sales Analysis operates under the Easyplus Windowing System.

It runs on the IBM Personal Computer and compatibles and is also available for local-area networks, according to the vendor.

Sales Analysis is priced at $395.

Computer Associates, 2195 Fortune Drive, San Jose, Calif. 95131.

■

Money Tree Software has announced **Moneytools**, a financial software package designed to run on IBM Personal Computers.

Moneytools contains three tool kits: data management, letters and text. Data management contains seven data base file programs for managing information in a financial service office.

Letters includes 40 form letters, and text is a collection of pages that explain different types of financial planning concepts and investment and insurance products.

The Moneytools package is priced at $125, according to the vendor.

Money Tree Software, Suite 200, 1753 Wooded Knolls Drive, Philomath, Ore. 97370.

■

Market Central, Inc. has announced its **Software Cabling System**.

The product is said to automatically design cables for the interconnection of RS-

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232 equipment.

It is used with IBM Personal Computers and compatibles to generate cable schematics from its data base of serial equipment.

The Software Cabling System also accepts user-defined entries for addition to the data base, according to the vendor.

The Software Cabling System is priced at $125, which, according to the vendor, includes documentation.

Market Central, 15 N. Jefferson Ave., Canonsburg, Pa. 15317.

■

Capsule Codeworks has introduced the product **Red Pencil**, which is an interactive software package for the markup and correction of electronic manuscripts and documents.

Red Pencil allows editors to make standard editing marks on a manuscript displayed on the computer screen, print the marked-up manuscript and automatically make the changes indicated at any time, according to the vendor.

Red Pencil runs on IBM Personal Computers and compatibles with an IBM Color Graphics Adapter card, composite or red-green-blue monitor and a Mouse Systems, Inc. PC-Mouse.

It is priced at $595.

Capsule Codeworks, 9024 132nd Place S.E., Renton, Wash. 98056.

Software Languages

CET Technology, Inc. has announced **CET Basic**, a compiled applications development language for Unix and Microsoft Corp. Xenix systems.

CET Basic programs may be mixed with programs and subroutines that are written in other languages, the vendor said. Standard Unix and Xenix system utilities, standalone productivity tools and C programs and subroutines can be combined to design applications. The product also uses industry standards like C-ISAM for indexed files and IEEE Format for binary reals.

CET Basic costs $695.

CET Technology, 5405 Garden Grove, Westminster, Calif. 92683.

Software Utilities

Advanced Systems Concepts, Inc. has unveiled **PC/Intact**, a distributed terminal management system for its Integrated Application Control System (Intact) transaction processing family.

PC/Intact runs on Digital Equipment Corp.'s Vaxmate personal computer and IBM's Personal Computer XT and PC AT. It performs distributed terminal management for VAX-based Intact transaction processing systems.

PC/Intact offloads forms processing, performs all terminal I/O and field edit check processing and can access a form data base across a network or with a local hard disk.

PC/Intact is priced at $595 per CPU. The right to copy costs $195.

Advanced Systems Concepts, 22 Hudson Place, Hoboken, N.J. 07030.

■

Telebyte Technology, Inc. has announced **Dataverter**, a utility said to enable users to convert mini or mainframe tape data into usable personal computer formats, as well as generate mini and mainframe tape data in many formats.

Users can output files to be printed on a mainframe printer by converting the PC-format print file into mainframe format and writing it to magnetic tape, according to the vendor.

Dataverter reportedly allows PCs to receive data in either variable or fixed-length records in EBCDIC or ASCII. With Dataverter, PCs can also output data with either delimiters or pad characters added or deleted as required.

Dataverter is priced at $900.

Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

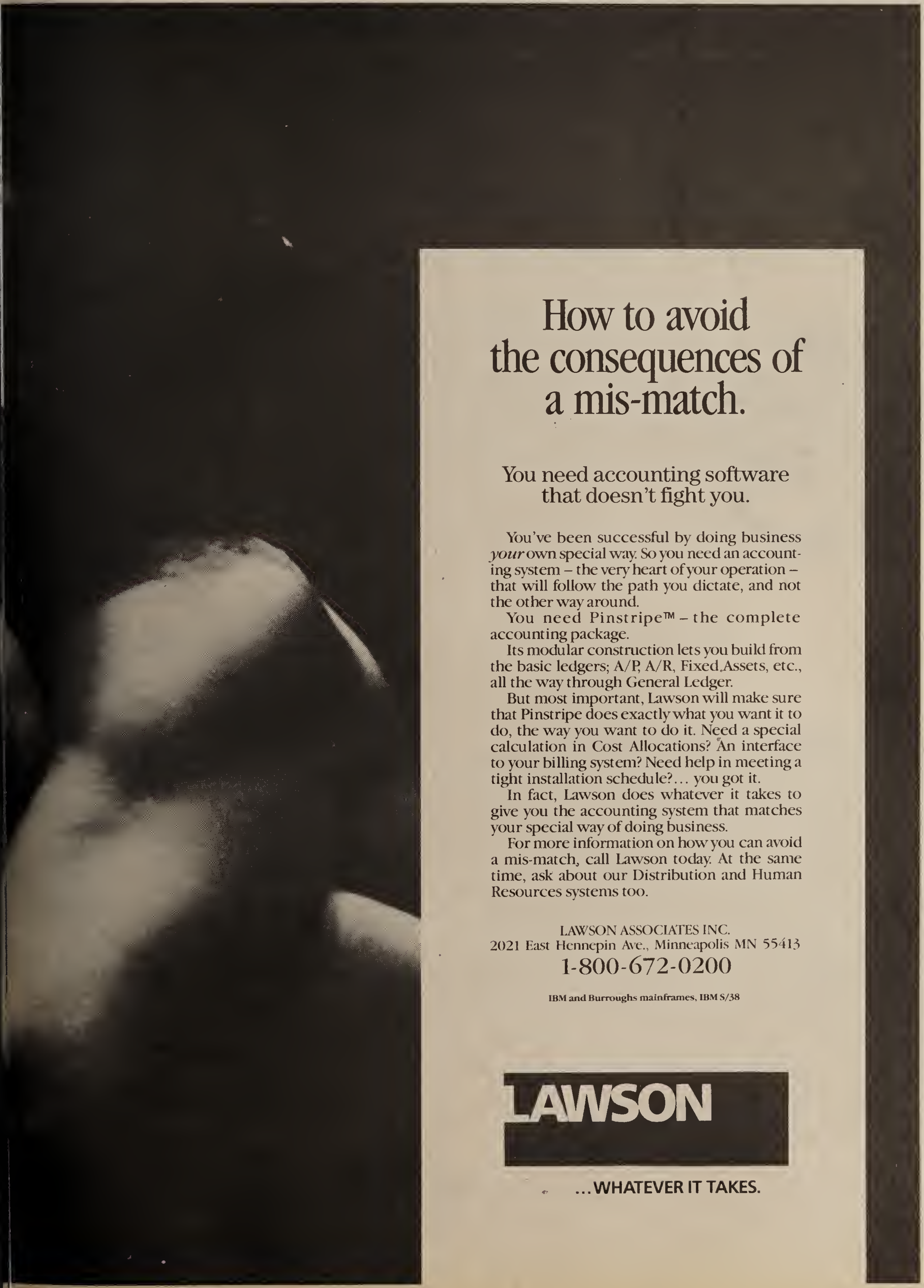
■

SWFTE International, Ltd. has introduced its **Laserware Plus**, which is a memory-resident publishing program for the Hewlett-Packard Co. Laserjet Plus printer.

The product is said to combine typesetting commands, text and graphics integration and forms management.

In addition to its commands, Laserwriter Plus includes an algorithm to optimize the use of the limited

Continued on page 110



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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 109

printer memory that is available in a standard Laserjet printer for graphics and line drawing, according to the vendor.

Laserware Plus operates with an IBM Personal Computer or compatible.

It is priced at $99.95.

SWFTE International, P.O. Box 219, Rockland, Del. 19732.

■

ESP Software Systems, Inc. has announced **Command Plus**, a command processor for IBM Personal Computers, Personal Computer XTs, Personal Computer ATs and compatibles.

Command Plus is said to replace Microsoft Corp.'s MS-DOS Command.

According to the vendor, the product supports all Command features and includes Command macros, Command recall, file browsing and a log facility that is used for tracking the amount of time that is being spent on projects.

In addition, the vendor said, Command Plus includes an interpretive batch-processing language.

Command Plus has a price tag of $79.95.

ESP Software Systems, Suite 309, 11965 Venice Blvd., Los Angeles, Calif. 90066.

■

Printers Software, Inc. has announced its **PSI/Schedule**, software designed to automatically plan job schedules in nearest half-hour intervals.

According to the vendor, PSI/Schedule considers delivery dates, production requirements, shifts, calendars and available resources of labor and machines to schedule jobs.

PSI/Schedule runs on IBM and compatible personal computers.

It is priced at $3,995.

Printers Software, 1395 Route 23, Butler, N.J. 07405.

■

Cambridge Computer Graphics has announced **Campaint** and **Camprint**, two software packages for use with its line of "eight shades of gray" and color displays.

Campaint is a rendering or coloring package designed for use with personal computer-based computer-aided design application software and any Cambridge Computer Graphics display.

It uses 16 or 256 colors or shades from a palette of 262,000 to create pictures and diagrams. Features include pop-up windows and a shaded coloring capability.

Camprint allows users to copy any image on a Cambridge Computer Graphics screen to a Calcomp Company or Mitsubishi Electronics America, Inc. color thermal printer, an Epson America, Inc. color impact or high-resolution dot matrix printer or Hewlett-Packard Co.'s laser printer.

Each package costs $295.

Cambridge Computer Graphics, 6201 Ascot Drive, Oakland, Calif. 94611.

■

Specialized Systems Consultants, Inc. has announced **Anzac**, a record management system.

Anzac is said to allow Unix users to define screens for two record types and then perform on-line data entry and access functions on the data. Editing and arithmetic functions are also included within the screen handler. The functions, as well as the record formats, are specified in a high-level description language rather than in C language.

Anzac is distributed in source code. It costs $150, including documentation.

Specialized Systems Consultants, P.O. Box 55549, Seattle, Wash. 98155.

■

Streamline Software Systems, Inc. has introduced a utility program said to allow users of its Sales Repeater personal computer software to export and import Ashton-Tate's Dbase and other ASCII files.

The utility allows users to create Sales Repeater files or update existing files from information stored in Dbase III. It also permits such master files to be updated from Sales Repeater files.

The import-export utility costs $99. It requires 19K bytes of random-access memory.

Sales Repeater costs $249.

Streamline Software Systems, Suite 1406, 14 Perimeter Center E., Atlanta, Ga. 30346.

■

Paperback Software, Inc. has announced **VP-Expert**, an expert system development tool.

VP-Expert is a rule-based product said to include an inductive front end that can create rules from information read from data in external files.

Knowledge base rules can be created with a built-in text editor or any word processor or text editor that produces ASCII files. It can also access data base files created by programs such as the vendor's VP-Infor and Ashton-Tate's Dbase as well as spreadsheets created using Lotus Development Corp.'s 1-2-3 and the vendor's VP-Planner.

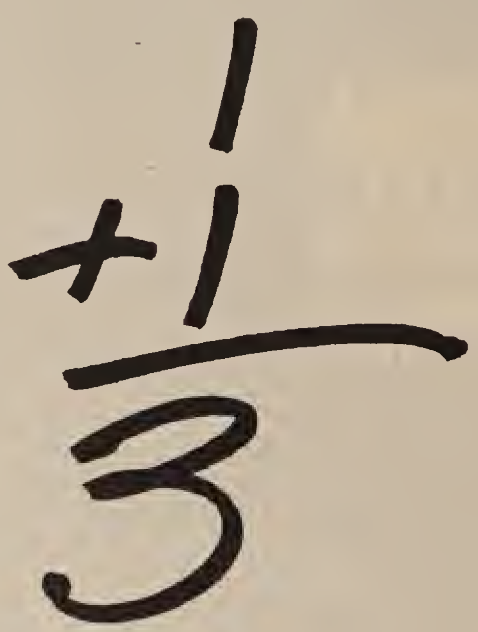
VP-Expert costs $99.95.

Paperback Software, 2830 Ninth St., Berkeley, Calif. 94710.

■

Enfin Software Corp. has announced **Goal Solutions**, the first in the Solution Series, a decision support library of memory-resident modules for Lotus Development Corp. 1-

Continued on page 112



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Continued from page 110

2-3 users.

Goal Solutions is said to add to 1-2-3 the capability of specifying goals that will be automatically solved by the program. According to the vendor, it can solve up to five goal specifications simultaneously. It also offers the processing of multiple goals in batch style with optional macro executions after each goal solution.

Goal Solutions is priced at $49.95.

Enfin Software, Suite 106A, 6920 Miramar Road, San Diego, Calif. 92121.

■

Capilano Computing Systems, Ltd. has announced its product **Logicworks**, a software package for designing and testing computer circuitry on the Apple Computer, Inc. Macintosh.

Logicworks is said to be an interactive system that presents a live circuit on the screen.

The software package then responds to connection, input and device parameter changes.

According to the vendor, other attributes include user-defined devices, logic arrays and timing sequence input.

Logicworks has a price tag of $159.95.

Capilano Computing Systems, P.O. Box 86971, N. Vancouver, B.C., V7L 4P6.

Software data base management systems

Morgan Software Inc. has announced **Info-Lion**, a relational data base management system for IBM Personal Computers and compatibles.

Info-Lion is said to allow users to define key-in specifications such as data field masking, decimal position alignment and double key-in for verification.

It also lets users define automatic prompt and automatic verification of date and time.

Once a record has been entered and validated, a query routine reportedly gives the user total access to it. Info-Lion can exchange data with other programs such as Lotus Development Corp.'s 1-2-3, according to the vendor.

Info-Lion is priced at $159.95.

Morgan Software, 414 Valley Ave., Wilmerding, Pa. 15148.

Software enhancements

Software Technology, Inc. has announced the release of enhancements for its **General Ledger System** (GLS), **Critical Data System** (CDS) and **Trust Accounting System** (TAS).

The enhanced systems are said to allow up to nine terminals to print reports at one time when used with Novel, Inc.'s Netware, IBM Personal Computer Network, Tandy Corp. Vianet or Microsoft Corp. MS-NET.

Enhancements to GLS include the ability to backdate journal entries.

Enhancements to the CDS calendar and docket control system include the ability to have annual dates that are used for reoccurring dates.

TAS was expanded to allow up to nine bank accounts for each trust account.

GLS costs $500; CDS costs $300; and TAS is priced at $400.

Software Technology, Suite 120, 620 N. 48th, Lincoln, Neb. 68504.

Quarterdeck Office Systems, Inc. has announced **Desqview Release 1.3**, an updated version of its multitasking operating environment.

The release is said to provide virtual 86-machine architecture support for the Compaq Computer Corp. Deskpro 386. The virtual 86-machine mode permits Intel Corp. 8088/86 code to be executed within the protected and paged environment provided by the Deskpro 386 and allows these programs to run simultaneously as if in their own 1M-byte personal computer. Release 1.3 also provides support for Microsoft Corp.'s Microsoft Word Version 3.

It runs on IBM Personal Computers, PC XTs, PC ATs, compatibles or the Deskpro 386 and costs $99.95.

Quarterdeck Office Systems, 150 Pico Blvd., Santa Monica, Calif 90405.

Lattice, Inc. has announced **Version 3.2** of its Lattice MS-DOS C Compiler for the Microsoft Corp. operating system MS-DOS.

This version features support for Microsoft Windows, including the far, near and Pascal key words, according to the vendor.

It also reportedly includes the ability to generate more than 64K bytes of static data and to declare objects larger than 64K bytes.

Version 3.2 also provides support for read-only memory-based applications.

The compiler has a price tag of $500.

Registered users of Versions 3.0 and 3.1 may upgrade at no charge. Users of earlier versions must pay an update fee of $75.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

Quixote Corp. has announced **Rapidwriter 1.1**, which is an enhanced version of its high-speed entry system.

According to the vendor, Rapidwriter Version 1.1 includes features such as improved methods of modifying chords, simplified means of documentation, overlapping screens or windows and automatic installation features.

The vendor also reports that Rapidwriter Version 1.1 combines software and a keyboard that will allow users of personal computers to enter frequently used words, complex phrases and standard text as well as clusters of commands with a single keystroke.

Rapidwriter 1.1 has a price tag of $395.

Quixote, One East Wacker Drive, Chicago, Ill. 60601.

*Source: International Data Corp. INFORMIX is a registered trademark of Informix Software, Inc. Other names indicated by TM are trademarks of their respective manufacturers. © 1986, Informix Software, Inc.

Communications

Odesta Corp. has announced its **Helix VMX** software designed to run on a Digital Equipment Corp. VAX through Apple Computer, Inc. Macintosh computers.

Helix VMX is said to allow users to create customized applications on Macintosh systems and run them without modification on a VAX under the VMS operating system. Connections between computers are made over an Appletalk network or multiple internets connected to an Ethernet backbone.

Helix VMX costs $450 for each Macintosh connected to any VAX or may be licensed according to the VAX configuration for $7,500 for a Microvax II to $20,000 on a larger VAX.

Odesta, 4084 Commercial Ave., Northbrook, Ill. 60062.

■

Digiboard, Inc. has announced the **Digiboard COM/8i** and the **COM/4i** multichannel communications boards for IBM Personal Computers.

The boards feature an on-board coprocessor and either four or eight asynchronous serial communications ports. The boards are said to have the I/O contained on a daughter card that mounts on the COM/Xi host board. Software includes a Microsoft Corp. MS-DOS device driver that allows the system to access up to eight ports per board, for a total of 32 ports per system.

The COM/8i costs $1,195 and the COM/4i costs $969.

Digiboard, 6751 Oxford St., St. Louis Park, Minn. 55426.

■

EKD Computer Sales & Supplies Corp. has released **Version 2.0** of its **PCanywhere** remote personal computer access and control communications software package, developed by Dynamic Microprocessor Associates.

Version 2.0 provides interactive support of IBM's Color Graphics Adaptor bit-mapped graphics card in both medium- and high-resolution modes.

According to the vendor, the software package supports up to 16 user-configurable communication ports and features a mode that allows the program to remain in the background while other applications are being used.

PCanywhere Version 2.0 is priced at $99.

EKD Computer Sales & Supplies, 764 Middle Country Road, Seldon, N.Y. 11784.

■

Novell, Inc. has announced a **Netware Parallel-Serial Printer Board** (PSPB), said to enable Novell's 6800-based local-area networks to support IBM Personal Computer-compatible parallel printers.

The Netware PSPB offers one serial and three parallel printer ports per board with optional upgrade kits to convert parallel ports to serial ports. The unit includes buffering. All cabling connections are pin compatible with IBM DB25 connectors, the vendor said.

Initial support for the board is included with System Fault-Tolerant Netware 68, Level I, to be released in January 1987. The board costs $4,995. Serial upgrade kits cost $60 each.

Novell, 748 North 1340 West, Orem, Utah 84057.

Data storage

CMS has announced the **T-120** and the **T-160** add-on tape drives for the IBM Personal Computer XT 286 and the Compaq Computer Corp. Compaq 386.

The external systems are available in 20M- and 60M-byte capacities. Both drives feature a transfer rate of 90K bit/sec. and tape speed of 90 in./sec. The T-120 has four tracks and the T-160 has nine. The models come with controller and menu-driven software for installation.

The T-120 is priced at $995. The T-160 costs $1,595.

CMS, 3080-A Airway Ave., Costa Mesa, Calif. 92626.

■

Extended Systems has expanded its **Sharedata** product family.

Sharedata Plus is said to allow a work cluster of up to four personal computers to share programs, data and an integrated ¼-in. cartridge tape backup facility. It is available with either 20M or 80M bytes of shared hard disk storage capacity and 60M bytes, IC-24 compatible, tape backup combined.

Four models are available, ranging in price from $3,595 to $5,995, depending on configuration.

The ESI-3774, priced at $3,995, and ESI-37749, priced at $4,395, are said to allow up to four personal computers to concurrently share 80M bytes of programs and data. The ESI-37749 includes four RS-422 interfaces.

Extended Systems, P.O. Box 4937, 6062 Morris Hill Lane, Boise, Idaho, 83711.

■

Rabbit Industries has introduced the **Magicdrive** hard disk drive for the Apple Computer, Inc. Macintosh Plus and Macintosh 512K E.

The disk drive is available in 20M-, 30M-, 65M- and 235M-byte versions.

According to the vendor, features include automatic error detection and correction, daisy-chaining, automatic head parking, print spooling, password security and backup utilities.

The 20M-byte Magicdrive is priced at $699; the 30M-byte version is priced at $899.

The 65M-byte version is priced at $1,299 and the 235M-byte version is priced at $3,399.

Rabbit Industries, Suite 304, 4505 Spicewood Springs Road, Austin, Texas 78759.

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Levco has unveiled **Overdrive 40**, a 40M-byte internal small computer systems interface hard disk drive for the Apple Computer, Inc. Macintosh.

Overdrive 40 is said to be compatible with the Macintosh Plus as well as the vendor's Prodigy 4 and 2M-byte Monstermac expansion memory. It comes with software utilities for installation, a desk accessory and backup. Other features include one-piece drive enclosure and access time of 29 msec.

Overdrive 40 is priced at $2,699.

Levco, Suite C-203, 6160 Lusk Blvd., San Diego, Calif. 91212.

Printers/Plotters/Peripherals

Toshiba America, Inc. has announced the **P351 Model 2** 24-pin dot matrix printer.

The printer features a front panel that allows users to select print quality, font, pitch, paper motion and quiet mode operation. It accepts six-part forms and provides Qume Sprint 11 daisywheel emulation and IBM Graphics Printer emulation. It prints at 300 char./sec. in draft mode and 250 char./sec. in the condensed printing mode.

Other features include three resident type fonts and 100 char./sec. letter-quality printing.

The P351 Model 2 costs $1,599.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

■

Juki Office Machine Corp. has introduced the **7100** and **7200** 24-pin dot matrix printers.

The 7100 offers a print speed of 83 char./sec. and 100 char./sec. in letter quality mode and 250 char./sec. and 300 char./sec. in draft mode. Features include a bi-directional platen paper feeder; a 7K-byte data buffer; a Centronics Data Corp. parallel and RS-232C serial interface; and IBM graphics emulation.

The 7200 offers 90 char./sec. and 108 char./sec. letter quality printing and 270 char./sec. and 324 char./sec. draft printing. It features front and rear paper loading as well as the ability to print multipart single forms.

The 7100 costs $1,795 and the 7200 costs $2,445.

Juki, 2043 S. Western Ave., Torrance, Calif. 90501.

■

Practical Automation, Inc. has announced the **TK series** of dot-matrix impact printers for use in adverse environments.

The TK printers feature a front-emerging paper path. Print speed is 275 char./sec., the vendor said. Other features include an integral paper cutter and registration controls for printing on preprinted paper.

Three versions are available, determined by paper width and number of characters per line.

Price for the 40-column Model TK 1003 is $896.

Practical Automation, Two Research Drive, Shelton, Conn. 06484.

■

Kimtron Corp. has announced the **KC-1** red-green-blue color monitor.

The IBM Personal Computer-compatible monitor features a nonglare 13-in. diagonal screen with a .43 mm dot pitch. It can display 16 colors and has a horizontal scanning frequency of 15.75 KHz, a horizontal retrace time of 11 msec, a vertical scanning frequency of 60Hz and a vertical retrace time of 1 msec.

The KC-1 is priced at $199.

Kimtron, Blgd 160, 1705 Junction Court, San Jose, Calif. 95112.

■

Tandem Computers, Inc. has added the **6AX/30, 6AX/1** and **6AX/2** workstations to its line of IBM Personal Computer AT-compatible goods.

The 6AX workstations were designed for use with Tandem Nonstop systems. The 6AX/30 features 30M bytes of disk storage. The entry-level floppy-disk models, the 6AX/1 and 6AX/2, offer 1.2M bytes and 2.4M bytes of disk storage, respectively.

All 6AX workstations include 512K bytes of random-access memory, one 1.2M-byte floppy drive, floppy/hard disk controller, keyboard, Microsoft Corp. MS-DOS and GW-Basic software.

The 6AX/1 costs $2,395; the 6AX/2 costs $2,595; and the 6AX/30 costs $2,595.

Tandem Computers, 19333 Vallco Pkwy., Cupertino, Calif. 95014.

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NEW PRODUCTS/MICROCOMPUTERS

Cambridge Computer Graphics has implemented Microsoft Corp. **Microsoft Windows** on its high-resolution color and monochrome displays.

The Cambridge 19-in. high-definition displays are said to provide users and system developers with a tool for What-You-See-Is-What-You-Get displays, computer-aided design and paint programs. According to the vendor, using Microsoft Windows as a graphics driver interface makes a high-resolution display available to any software package that is fully ported to the Windows environment.

The interface costs $99.

Cambridge Computer Graphics, 6201 Ascot Drive, Oakland, Calif. 94611.

Board-level devices

Verticom, Inc. has announced Models **H-256, H-16B, M-256E** and the **CAD-480** personal computer graphics controllers

The H-256 features two output ports that allow for single- or dual-screen operation. The H-16B is a simplified version of the vendor's H-16. It offers a high-performance/high-resolution mode of operation.

The M-256E is a reintegrated, single-board version of the Verticom M-256 controller. It is plug-compatible with the IBM Professional Graphics Controller and provides emulation of the IBM Color Graphics Adapter.

The CAD-480 offers a variety of emulation modes when working in conjunction with a multisync monitor.

The H-256 costs $3,795. The H-16B costs $2,295. The M-256E costs $1,695, and the CAD-480 costs $695.

Verticom, 545 Weddell Drive, Sunnyvale, Calif. 94089.

■

Hewlett-Packard Co. has introduced the **HP-IB Command Library** providing instrument control capability for the HP Vectra Personal Computer, the IBM Personal Computer and compatibles.

The HP82990A HP-IB Interface Card/Command Library and HP 82990E Command Library provide support for HP-IB and GPIB instruments as well as printers and plotters. The command library includes commands in Basic, Pascal or C programs to control HP-IB instruments. It also provides capability for high-speed string transfers.

The HP-IB Interface Card and Command Library costs $400. The HP-IB Command Library software costs $295. The upgrade from the HP 61062AA/BA to the HP 82990A costs $95.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■

Demco Electronics has announced a **graphics system** for Apple Computer, Inc. Apple II series of computers.

The hardware is said to display the complete width and half the height of an 8½- by 11-in. drawing. Other hardware features include an Apple mouse-compatible port and the ability to display any one of eight 640- by 384-pixel screens. Software features include automatic windowing, variable grid lock, draw options access from a pop-over bar menu, text insertion in four directions, text cursor matching font height and position, proportionally spaced fonts and block functions.

The package is priced at $395.

Demco Electronics, 10516 Grevillea Ave., Inglewood, Calif.

■

Ariel Corp. has announced the **DSP-16**, a signal acquisition, synthesis and processing system on a plug-in card for the IBM Personal Computer, PC XT or AT.

The DSP-16 is said to combine two channels of high-speed, high-resolution I/O conversion, a 256K-byte data buffer and Texas Instruments, Inc.'s Digital Signal Processing microprocessor, the TMS32020.

The DSP-16 features 16-bit resolution and 50-KHz programmable sample rate as well as simultaneous sampling and external gating of the acquisition process. The unit comes with the PC Sampler software package consisting of a program development system and five application programs.

The DSP-16 costs $2,495.

Ariel, Suite 404, 110 Greene St., New York, N.Y. 10012.

■

NSI Logic, Inc. has introduced **Smart EGA**, a half-size enhanced graphics adapter for IBM Personal Computers.

Smart EGA is said to provide compatibility with the IBM Enhanced Graphics Adapter, the Color Graphics Adapter and the Monochrome Display Adapter.

The graphics adapter is also compatible with the Hercules Graphics Controller display mode.

According to the vendor, the adapter can operate with any standard enhanced color display.

Users can choose 16 colors from a palette of 64.

Smart EGA costs $549.

NSI Logic, Cedar Hill Business Park, 257-B Cedar Hill Road., Marlboro, Mass. 01752.

Auxiliary equipment

Engineered Data Products, Inc. has announced the **Add-a-Cad Model 2020**.

The unit is said to assemble into a computer-aided design station that accommodates a variety of personal computers, digitizing equipment and up to a 19-in. diagonal video monitor. In addition, Add-a-Cad rolls over existing desks up to 62-in. wide. The

Continued on page 116

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Based on the 16-bit Intel 80286 microprocessor, the Tandy 3000 HD (25-4001) operates at 8 megahertz for high-speed performance. The Tandy 3000 HD features 640K main memory and a 5¼" slim-line floppy disk drive designed to read both 1.2-megabyte and 360K formats. This allows it to run either IBM PC/AT or IBM® PC software.

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Continued from page 115

unit features a lockable security door and ventilated monitor housing. A wire management system is incorporated in the cabinet for routing of the system's cables.

The Add-a-Cad is priced at $695.

Engineered Data Products, 470 E. 76th Ave., Denver, Colo. 80229.

■

Allied Electronic Services Inc. has announced **Tempo PC Monitor**, **PC Multifunction Board** and a **Twinaxial Cable Tester** for IBM Personal Computers and compatibles.

The Tempo PC Monitor displays statistics in percentage and bar graph form on color graphics or monochrome monitors. Statistics given include keystrokes per hour; active vs. idle time; programs executed and disk files accessed; and terminal emulation time. It costs $395.

The multifunction board comes with 0 to 512K bytes of memory, a parallel port, a serial port and a battery-backed clock/calendar. It costs $195.

The Twinaxial Cable Tester tests a single cable before installation or one or more cables connected in a series with display stations on printers on the IBM System/34, 25, 38, 5260, 5280 and 5520 computer systems. It costs $98.95.

Allied, P.O. Box 819, Lebanon, N.H. 03766.

COMMUNICATIONS

Controllers

Standard Microsystems Corp. has introduced the **Arcnet-PC310 Short Slot Fiber Optic Local-Area Network Controller Board**.

The Arcnet-PC310 was designed for IBM Personal Computers and compatibles. It features a 2K-byte on-board data packet buffer and an 8K-byte on-board programmable read-only memory. It is said to provide extended operational distance between active units up to 4,000 feet.

The Arcnet-PC310 is priced at $1,295.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

■

Zenith Electronic Corp. announced that it has added 8- and 16-port network communication units (NCU) and a network manager system to its **Z-LAN** local-area network product line.

The NCUs are said to allow asynchronous devices to communicate on a broadband network.

Each port on the Z-LAN network communications units can establish a circuit with any other port on the network.

According to the vendor, up to 16 devices can communicate with each other without going through the entire system.

The network manager is a dedicated Zenith Data Systems, Inc. IBM Personal Computer XT-compatible microcomputer designed to perform management tasks.

The Z-LAN 500M 8-port NCU is priced at $2,400, and the Z-LAN 500H 16-port NCU is priced at $3,500. The Z-LAN 500MGR network manager is priced at about $12,000.

Zenith Electronic, 699 Wheeling Road, Mount Prospect, Ill. 60056.

Voice/data communications

Showcase Micro Systems has announced a voice-synthesis package, called **Zak**, for stand-alone personal computers and local-area networks.

Zak is said to convert ASCII text into speech, can extract test or data from a host data base and has an unlimited vocabulary.

Software for Zak includes Messagenet, which supports up to 255 users and stores both caller and receiver data and provides on-line Help.

Zak, packaged with either Messagenet or the Voice DB data base manager is priced at $7,750, which includes one voice-response board. Additional boards cost $3,300 each.

Showcase Micro Systems, 2323 Cheshire Bridge Road, N.E., Atlanta, Ga. 30324.

Software

Management Access Control Systems Inc. has announced **Micro-Max**, a call accounting system said to be compatible with private branch exchange and key systems that offer station message detail recording/call data recording (SMDR/CDR) capabilities.

Micro-Max software is said to allow the SMDR format to be added or revised remotely. It stores 65,000 call records per file and the host system can poll multiple sites. Firmware can reside in an expansion slot of a personal computer or as an external unit for on-site or remote polling.

Compatible with all IBM PC-DOS and Microsoft Corp. MS-DOS operating systems, a single-site installation costs $2,600, and additional remote sites cost $1,500.

Management Access Control Systems, Suite 103, Building E, 2517 Highway 35, Manasquan, N.J. 08736.

■

The Wollongong Group has introduced the **NFS Option**, an enhancement to its Wollongong Integrated Networking Solutions family for Digital Equipment Corp. VAX/VMS and Microvax/VMS-compatible systems.

The Network File Systems (NFS) Option is said to provide support for Sun Microsystems Inc.'s series and utilize the Transmission Control Protocol/Internet Protocol.

The NFS Option for WIN/VX costs $5,000, and for WIN/UVX, it costs $2,500.

The Wollongong Group, 1129 San Antonio Road, Palo Alto, Calif. 94303.

THE LAN RULE BOOK

RULE #1

DON'T EXPECT A 10 MBPS
LOCAL AREA NETWORK
TO ACTUALLY *OPERATE* AT 10 MBPS.

THE EXCEPTION TO THE RULE: **ProNET**®

NEW PRODUCTS/COMMUNICATIONS

The Lanier Business Systems Division of Harris Corp. has announced both **3270 BSC** and **3270 SNA** communications protocols for its Concept 4300 and Concept 4300 Tower series of personal computer networks.

When supporting both the BSC and SNA protocols, the PC network servers support up to eight devices as a 3276 controller and up to 32 devices as a 3274 controller.

3270 BSC is said to allow all system printers supported by the Microsoft Corp. Xenix print server to emulate 3278 DCS printers. The 3270 SNA release allows the Concept 4300/Tower servers to provide 3270 mainframe connectivity using SNA/SDLC protocols.

Both products cost $895.

Lanier Business Systems, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

Cross Information Co. has announced **Cross/Point-LAN 4.0.**

The software is a version of the Cross/Point 4.0 product line said to provide electronic mail, conferencing, bulletin board and memo networking on IBM PC-DOS/Microsoft Corp. MS-DOS-based local-area networks. Features include window access to Help and applications such as education and strategic planning.

Cross/Point-LAN 4.0 costs $695 per site for Novell, Inc. Netware Version 2.0a.

Cross Information, Suite 311, 1881 Ninth St., Boulder, Colo. 80302.

■

Proteon, Inc. has announced its Transmission Control Protocol/Internet Protocol (TCP/IP) **software and programming libraries** for its token-ring networks for IBM Personal Computers.

Models P5231 and P5233 software packages are said to permit personal computers on its Pronet-10 and Pronet-4 networks, respectively, to access other TCP/IP hosts on the network, such as University of California at Berkeley 4.2 VAX Unix and Digital Equipment Corp.'s Ultrix-32 and VAX/VMS.

Application protocols featured in the TCP/IP implementation in the P5231 and P5233 software include file transfer, remote logon and electronic mail.

The P5232 Programming Libraries allow users to develop applications for Pronet-10 and Pronet-4.

P5231 and P5233 cost $400 per node. The P5232 Libraries cost $500.

Proteon, Two Technology Drive, Westboro, Mass. 01581.

Multiplexers/Modems

Anderson Jacobson, Inc. has announced the **AJ 2441-1**, a 2400 bit/sec. modem that operates on the dial network or leased lines.

The modem is a Hayes Microcomputer Products, Inc.-compatible card and features a memory dialer, optional Microcom Networking Protocol error detection and correction, security features and unattended automatic switched-network dial backup in leased-line applications.

According to the vendor, the modem operates synchronously or asynchronously.

The AJ 2441-1 modem card and the AJ 2441-1 modem in a stand-alone enclosure are priced at $695 and $825, respectively.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

There are two things you hear so often about local area networks that you may have come to believe them: 1) they don't actually *run* up to spec; 2) you'll never *need* them to.

The first *is* true. Most local area networks don't deliver their claimed throughput, especially at peak load.

The second is false. Of course you'll need the capacity, and not just for expansion. Think about it. Although you may have an *average* need for relatively low capacity, your network will often have to carry heavy traffic. Take four o'clock in the afternoon, with everything humming. That's *just* when you need peak performance. ProNET performance: the exception to the rule.

By combining the speed of token ring topology with the reliability of a star configuration, we deliver what we promise: high performance networks that work best when you need them most. We offer *three* interoperating networks guaranteed to run at 4, 10, and 80 Mbps. So now, you can easily open up your computer networks to full-system capacity. Using ProNET-4, ProNET-10, and ProNET-80, you can confidently link large PC clusters, PCs to minis and mainframes, and PCs, workstations, minis and mainframes all on the *same* network.

ProNET-4 is interoperable with the IBM® Token-Ring standard, but doesn't lock you in. ProNET-10 offers you higher performance. And ProNET-80 *truly* provides 80 Mbps of information-carrying capacity for such data-intensive applications as medical imaging, seismic readings, CAD/CAM, and flight simulation.

Because ProNET is full-functioned, you can tune it precisely to *your* system needs. It delivers virtually all you'd expect of a network: *backplane-to-backplane* connections, so you can easily integrate, for instance, IBM, Digital, Cray, and Sun computers; smooth software interfaces; your *choice* of media, including shielded twisted-pair, coax, fiber, infrared, microwave, and the IBM Cabling System; the speed you need for your capacity; and multiprotocol gateways to *other* networks, including SNA, DECnet™, Ethernet®, ARPANET, T1, and other common carriers. You can hardly call it "local."

Too good to be true? No, *fact.* We've been installing token ring networks since 1981. There are thousands of Proteon networks operating in the field ... over 35,000 nodes at current count. Most importantly, our *users*—in a 1986 *Data Communications* comparison with major LAN. vendors—gave us the highest scores for versatility, speed, heavy-traffic throughput, and overall performance. We guarantee that once you're acquainted with ProNET, you'll rule out a lot of notions you've had about local area networks.

So, ask us for a free copy of the new, informative, 24-page *LAN Rule Book.* It will clearly explain what you can expect from networks today, and it's handy reference guide will help you cut through the smoke screens of hotly competing LAN vendors. We're Proteon, Inc., Two Technology Drive, Westborough, MA 01581-5008, (617) 898-2800.

For a free copy of *The LAN Rule Book*, just call 800-BEST LAN.

proteon

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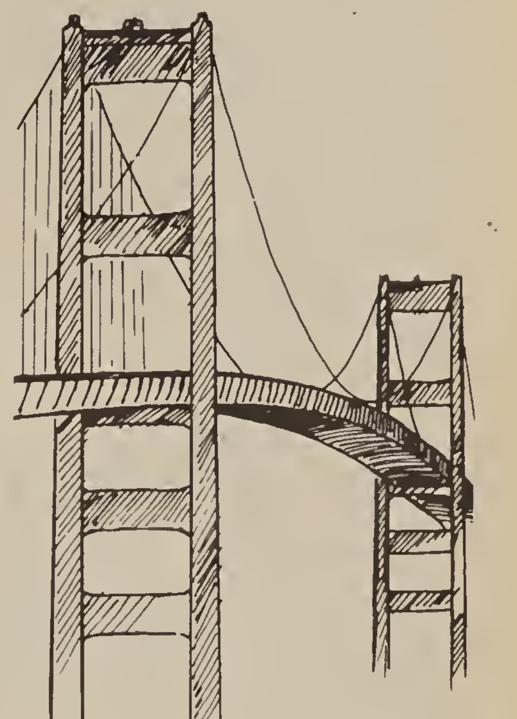

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Trax Softworks, Inc., 10801 National Blvd., Los Angeles, CA 90064

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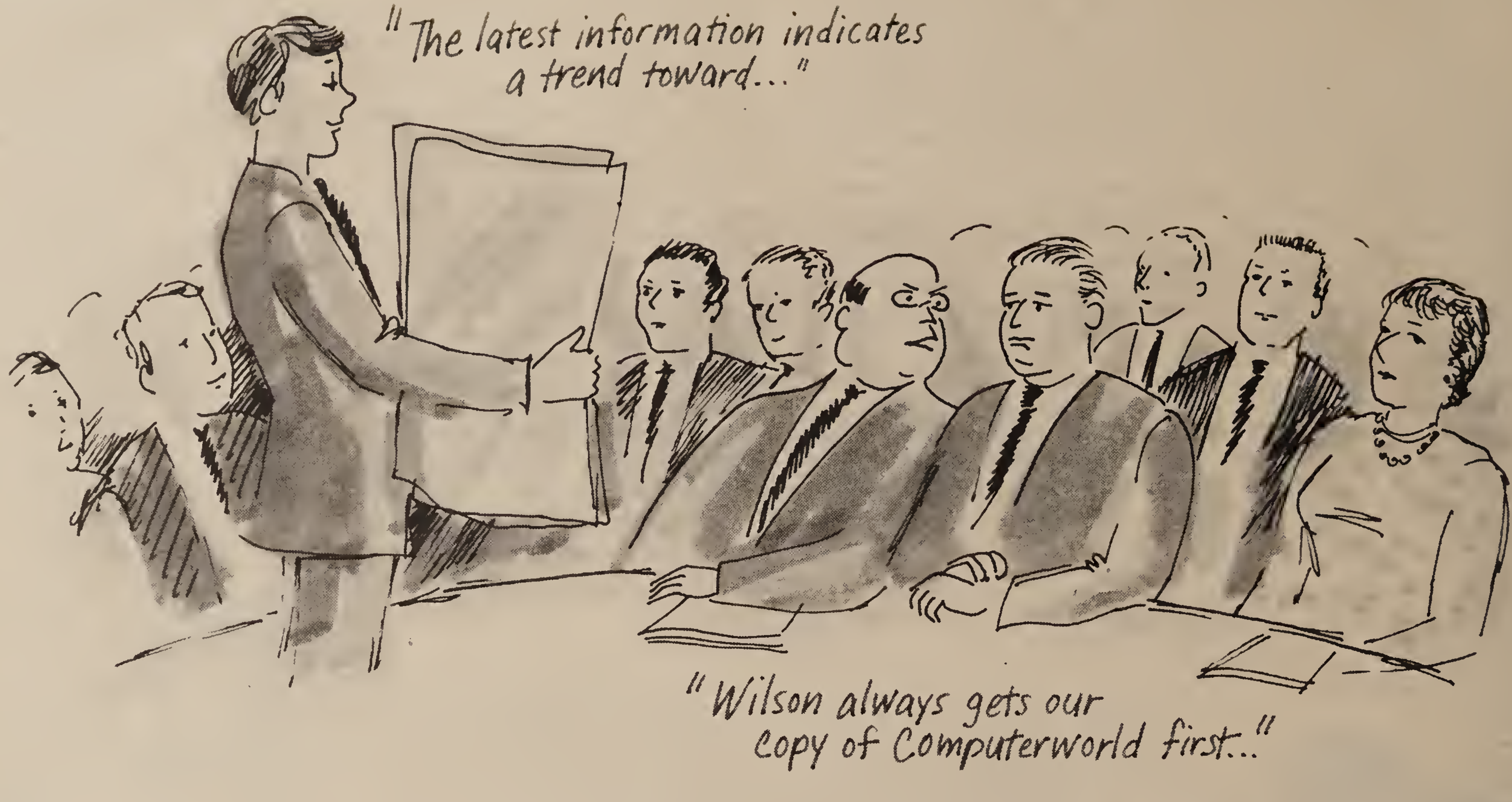
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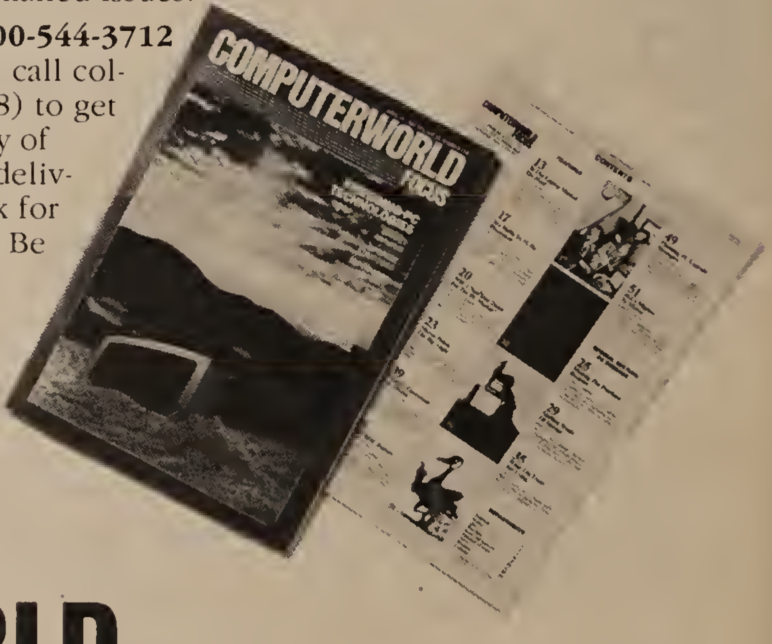


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

NEW PRODUCTS/COMMUNICATIONS

Racal-Milgo, Inc. has introduced the **RM-1822D** dial modem designed for asynchronous communications at speeds up to 18K bit/sec. over ordinary telephone lines.

The modem is said to operate by the AT&T 103 standard, AT&T 212A, CCITT V.22 and CCITT V.22 bis. It provides network management and diagnostic functions and features autodial and autoanswer, leased line operation, automatic speed selection and software and hardware flow control.

The stand-alone RM-1822D is priced at $2,395.

Racal-Milgo, 1601 N. Harrison Pkwy., Sunrise, Fla. 33323.

■

Data Race, Inc. has added the **Mach VIII** to its Mach family of modular asynchronous statistical multiplexers.

The Mach VIII is said to be able to link up to eight asynchronous devices over a single leased line. It features a diagnostic port, data compression and automatic error detection and correction. Asynchronous ASCII devices connected through the unit may run at data rate settings from 1,200 bit/sec. to 19.2K bit/sec.

The Mach VIII is priced at $1,295. An optional internal V.29 9.6K bit/sec. synchronous modem may be included for an additional $1,195.

Data Race, Suite 108, 12758 Cimarron Path, San Antonio, Texas 78249.

■

Penril Datacomm has announced enhancements to its **Datalink 4800**, **9600** and **9600 Fast Train** modems.

Added features include autodial backup; a receive-signal-quality graph that allows the user to determine the quality of the receive signal from a bar graph displayed on the front panel; a remote monitor screen; the ability to simultaneously broadcast front panel messages from a master modem to several multidrops; and updated diagnostic features.

The Datalink 4800 costs $1,295; the Datalink 9600 costs $1,795; and the Datalink 9600 Fast Train costs $1,995.

Penril Datacomm, 207 Perry Pkwy., Gaithersburg, Md. 20877.

■

Everex Systems, Inc. has announced the **Evercom-24**, a 2,400 bit/sec. half-card sized modem.

The modem is said to offer Hayes Microcomputer Products, Inc., AT&T 212A/103, CCITT V.22 and V.22 bis compatibility.

According to the vendor, the modem features autodial, autoanswer, automatic redialing, autodata transfer, rate adjustments and automatic data-to-voice switching.

The Evercom-24 modem also operates in full- or half-duplex modes.

Other attributes include call-progress monitoring, off-hook detection and switch-selectable port addressing.

The Evercom-24 is priced at $289.

Everex Systems, 48431 Milmount Drive, Fremont, Calif. 94538.

Anderson Jacobson, Inc. has announced the **AJ 2400-2H01** modem.

The 2,400 bit/sec. multiprotocol internal modem card was designed for the IBM Personal Computers and compatibles. It features Hayes Microcomputer Products, Inc. AT command-set compatibility and Microcom Networking Protocol error detection and correction.

Other features include flow control and alternative number dialing as well as a menu dialer.

The AJ 2400-2H01 is priced at $650.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■

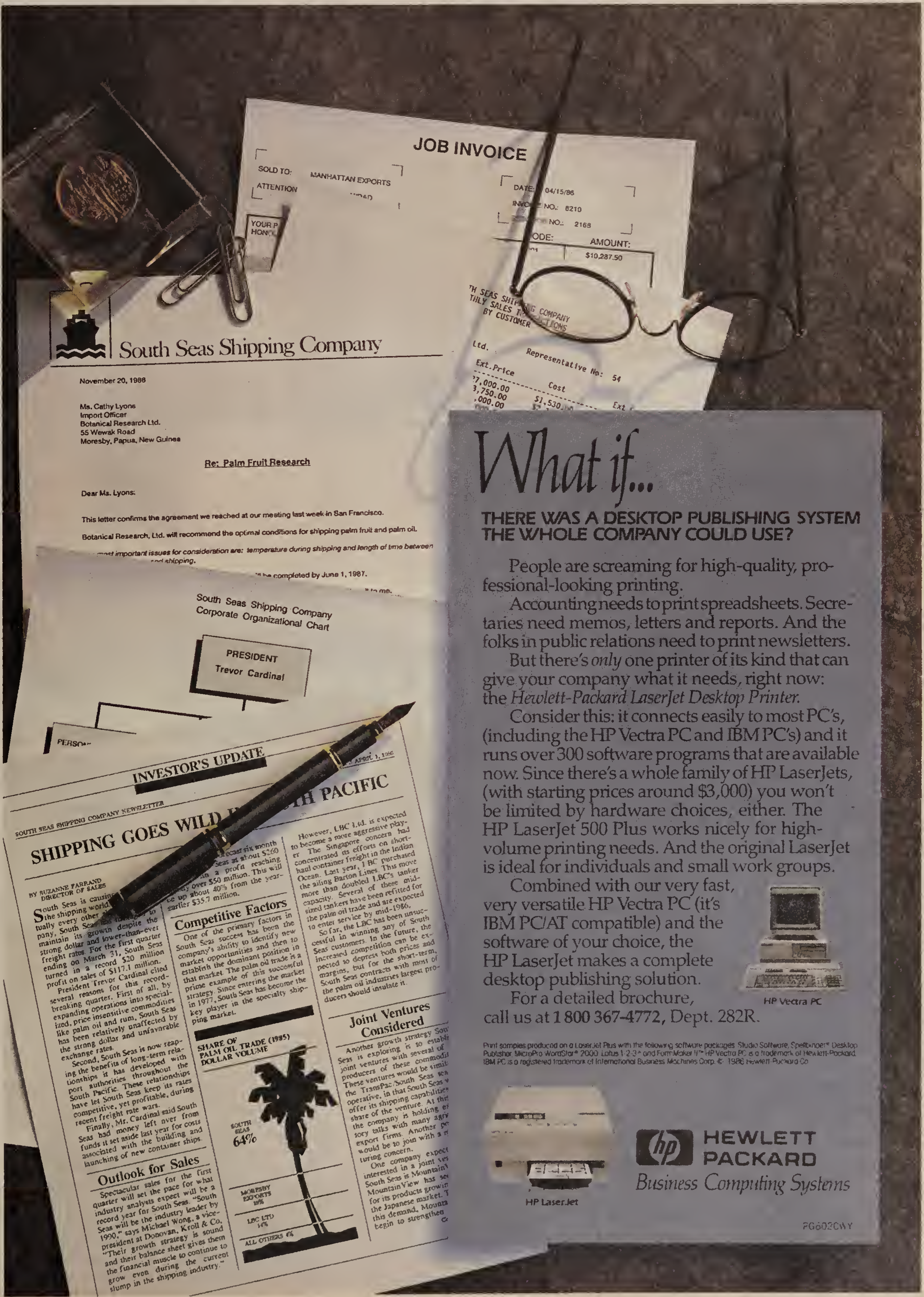
Electronic Information Technology, Inc. has introduced **PC-Fax**, a multifunction 9.6K bit/sec. modem board and software for IBM Personal Computers.

PC-Fax includes complete PC-to-PC communications via software allowing users to poll and receive any disk file. It also handles Group III transmissions between facsimile machines and PCs.

PC-Fax includes a PC facsimile device controller with 9.6K bit/sec. modem plus menu-driven software that provides image handling and text-image merging.

PC-Fax costs $1,095.

Electronic Information Technology, 373 Route 46 W., Fairfield, N.J. 07006.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Our 3B computer family is among the first to blend the technologies of data processing and communications. Result: a unique ability to distribute processing power across system lines, from user to user, desktop to department, and department to mainframe.

AT&T's 3Bs are easily linked *up* to IBM* mainframes and *down* to any combination of terminals, peripherals, and MS-DOS** PCs. The idea is to open communication between

COMPUTERS WITH THE FUTURE BUILT IN

3B2/310. Supports up to 14 users, 18 RS232C ports. Speed: 1.1 MIPS, 32 bits at a time. *All* 3Bs are 32-bit machines. Storage: 86MB internal hard disk; up to 516MB with Expansion Modules.

3B2/400. Supports 10 to 25 users, 46 RS232C ports. Speed: 1.1 MIPS. Storage: 172MB internal, to 860MB with Expansion Modules.

3B2 XM. Expansion Module adds 23MB cartridge tape storage and/or 30 to 72MB hard disk storage.

3B15. Serves 16 to 60 users, 128 RS232C ports. Speed: 1.6 MIPS. Supports 8 drives, with maximum storage of 2.7 *giga*bytes.

Not shown: Other members of AT&T's 3B computer family serve up to 100 users, across a wide range of business needs and environmental conditions.

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On the hardware side, the whole 3B family is like a big set of building blocks. Everything is modular. A system of feature cards and interfaces makes it easy to add functions or peripherals. Or add users. Or boost performance. Or all of the above—in any order, at your own pace.

Example: A 3B "starter" system that is cost-efficient for 6 users can easily grow to serve 60 users—and more—with the same efficiency. By networking 3B to 3B you can support *thousands* of users—like adding beads to a string.

Whether those "beads" are down the hall or an ocean away, AT&T's networking tools can swiftly unite them all into a single, flexible, responsive system.

WHERE ARE YOU GOING?

AT&T's 3B family was created *as a family* to enhance the systems you have today, without imposing limits on where you can go tomorrow.

You can start with the pieces you need to solve today's problem: linking mainframe and desktop, say; or pulling together a department. As your needs and ambitions change, so can your system. AT&T makes the pieces fit.

To learn how much we can do for your company today, and how far we can take you tomorrow, please contact your AT&T Account Executive, authorized supplier, or telephone 1 800 247-1212.

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DEC and VT-220 are trademarks of Digital Equipment Corporation.

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NEW PRODUCTS/COMMUNICATIONS

Local-area networks

Applied Knowledge Groups, Inc. has introduced the **Knowledge Network**, a software-based network for Zenith-100 Personal Computers and IBM Personal Computer compatibles.

The memory-resident package consists of IBM PC-DOS/Microsoft Corp. MS-DOS software, modular telephone cords and RJ-11 connectors to join up to six computers via RS-232 serial ports. Users can share disks, random-access memory (RAM) disks, printers and other peripherals.

The network can be connected in a bus, star, tree, ring or other configuration. It has no centralized file servers, provides data security features and requires 80K bytes of disk space and 48K bytes of RAM.

The network costs $199 per node for the Z-100 and $149.50 per node for IBM PC compatibles.

Applied Knowledge Groups, Suite 203, 1095 E. Duane Ave., Sunnyvale, Calif. 94086.

■

Novell, Inc. has announced a nondedicated version of its **Advanced Netware 286** local-area network operating system.

The version is said to allow Netware 286A and 286B file servers, IBM Personal Computer ATs and compatible systems to operate concurrently as both file server and workstation. The option provides 640K bytes of memory for application programs as all file server processing takes place in extended memory. Up to 100 users per file server are supported, the vendor said.

The Advanced Netware 286 nondedicated option is priced at $2,195.

Novell, 748 North 1340 West, Orem, Utah, 84057.

Network services

General Electric Information Services Co. has announced the worldwide availability of the **Businesstalk System**, which uses either Apple Computer Inc. Macintosh or IBM Personal Computer-compatible programs to interface with the vendor's worldwide teleprocessing network.

The Businesstalk System is said to provide textual data bases, bulletin boards, access to GE's Quik-Comm System global electronic mailbox service and two microcomputer programs to interface with the system.

The Businesstalk System base price is $36 an hour for end users.

General Electric Information Services, 401 N. Washington St., Rockville, Md. 20850.

■

General Electric Information Services Co. has added **Quik-Gram Service** to its General Electric Network for Information Exchange (Genie).

Quik-Gram is a hard-copy electronic mail service said to enable a user to communicate with anyone who has a U.S. postal address. Messages up to five pages long are transmitted electronically to designated printing sites across the U.S., where they are then mailed.

Quik-Gram costs $2 for the first page and 75 cents for each additional page.

General Electric, 401 N. Washington St., Rockville, Md. 20850

Test equipment

Atronix, Inc. has announced the **Atronix RS-232 Mini-Test Box**, an on-line test box said to identify data and control signals being transmitted in RS-232 lines.

The test box features dual-state LEDs to indicate positive or negative voltage and show line activity, as well as the status of that activity, the vendor said.

The test box can be installed anywhere in the RS-232 loop.

The LEDs indicate status of Transmit Data, Receive Data, Request to Send, Clear to Send, Data Set Ready, Carrier Detect and Data Terminal Ready.

The Atronix RS-232 Mini-Test Box costs $21.

Atronix, 207R Cambridge St., Burlington, Mass. 01803.

Auxiliary equiment

Telebyte Technology, Inc. has introduced the **Model 76 DPS** card cage system said to provide dual, redundant power supplies for data communications.

The Model 76 card cage accepts short-haul modems or RS-422 and current loop interface converters also manufactured by Telebyte. They draw power from an integrated power distribution network provided by two power supplies operating in a parallel load sharing mode.

The Model 76 DPS occupies 5¼ in. of vertical rack space in a standard 19-in. equipment rack. It will accommodate 11 dual modems or interface converters, the vendor said.

The Model 76 DPS costs $1,050.

Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

Fibercom, Inc. has announced the **Whisperlan/RPT** fiber-optic remote repeater link.

The Whisperlan/RPT repeater link is said to connect two coaxial Ethernet segments up to 2,000 meters apart.

Attributes of the link include an integrated repeater and fiber-optic transceiver.

According to the vendor, the fiber-optic remote repeater link eliminates ground loops and problems associated with lightning strikes and electrical storms as well as increases data security between buildings.

Two Ethernet segments can be interconnected for $2,500.

Each additional Ethernet segment link interconnection is priced at $1,250.

Fibercom, P.O. Box 11966, Roanoke, Va., 24022.

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Selling products. NCC '85 attendees have been tracked and surveyed over the last year. In the 9 months following the 1985 NCC, *70 percent of attendees bought products they had seen exhibited at the conference.* Another 54 percent expect to buy products or services seen at the NCC within the next 12 months. The average dollar purchase made by NCC attendees was over $873,000.

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SYSTEMS & PERIPHERALS

Turnkey systems

Landmark Graphics Corp. has announced the **Landmark Desktop Workstation**, a Unix-based interactive system for interpreting seismic and geologic information.

Based on the IBM RT Personal Computer, it includes graphics hardware, array processor technology, additional mass storage and Unix-based software.

The software includes data bases, mapping, graphics display and manipulation of seismic and geologic data.

A standard model includes a 16-in. monitor with 1,280- by 1,024-pixel resolution, a keyboard, a mouse, a 330M-byte hard disk drive and the IBM RT PC and costs from $65,000.

Landmark Graphics, Suite 100, 333 Cypress Run, Houston, Texas 77094.

Processors

Bit 3 Computer Corp. has unveiled the **Model 411 VME-VME Adaptor** to permit the interconnection of two Motorola, Inc. VMEbuses.

The adapter consists of two VMEbus cards. The systems connect via a round electromagnetic interference shielded cable at distances to 50 feet. Address mapping enables a VMEbus master in one chassis to directly address VME memory or I/O in the other chassis as though it were local memory or I/O. It also includes direct addressing mode enabling 65K bytes to 16M bytes of remote VMEbus memory to appear as local VMEbus memory.

It costs $1,480.

Bit 3, 8120 Penn Ave. S., Minneapolis, Minn. 55431.

■

EMC Corp. has announced **Stretch-16**, a memory conversion subsystem for Digital Equipment Corp. VAX-11/750 systems.

The subsystem is said to double the memory capacity of the VAX-11/750. It allows users to replace either two or three 1M-byte boards with 4M byte arrays for a total of 14M and 16M bytes, respectively.

The base price for the subsystem is $7,900, including memory controller and two 4M-byte memory arrays.

EMC, 12 Mercer Road, Natick, Mass. 01760.

MDS Qantel, Inc. has announced the board-level coprocessor version of its personal computer-oriented product line, the **Q8K**.

Installed in an IBM Personal Computer AT, the Q8K links the Qantel Best/AOS operating system to the PC, permitting the PC to operate Qantel applications software or operate as usual under its own IBM PC-DOS system.

Two versions of the Q8K are available: A 512K-byte version, for $1,500 and the version with 1M-byte of memory, for $1,900.

MDS Qantel, 4142 Point Eden Way, Hayward, Calif. 94545.

■

Sigma Information Systems, Inc. has announced the **SA-H147** CPU enclosure with backplane options for both Digital Equipment Corp.'s LSI-11 and Microvax applications.

The 7-in.-high enclosure is available in a standard 19-in. rack-mount or tabletop version.

It includes a 12-row, quad-wide backplane with 24 dual DEC Q-bus slots for the LSI-11 or 18 dual, plus three C-D slots for Microvax applications, according to the vendor.

The backplane assembly includes 22-bit addressing, termination resistors and an interrupt priority structure.

The SA-H147 CPU enclosure is priced at $1,917.

Sigma Information Systems, 3401 E. La Palma Ave., Anaheim, Calif. 92806.

CAD/CAM/CAE

Clarity Systems, Inc. has announced its **Superset 5000** computer-integrated engineering systems product line.

Superset 5000 runs on Apollo Computer, Inc. hardware and is available in sets.

Clarity's Baseset, which includes the systems' common data base, human interface and administrative utilities, and Strucset, the design capture tool, are prerequisites to all systems.

Other sets include the company's Topset, a set of tools for topological design; Geoset, tools for geometric layout design; Gluset, a layout compiler; and Plaset, which automatically generates physical layouts of programmable logic array.

The Superset 5000 software ranges from $6,500 to $60,000. The complete product, bundled with an Apollo DN570 Turbo, is priced at $174,900.

Clarity Systems, Suite 290, 710 Lakeway, Sunnyvale, Calif. 94086.

Graphics systems

Tektronix, Inc. has announced the **Tektronix 4690F42**, a software driver for Sun Microsystems, Inc.'s Sun-3/160C workstations.

When used with the Tek 4692 Color Graphics Copier, the driver is said to allow users to produce color hard copies of the display. The software driver frees the workstation display so users can continue design work while hardcopies are being made. It can be loaded on Sun's workstation nodes or on the file servers.

Features include transparency repaint, full-page or reduced image size, black-white inversion and selectable image processing.

Continued on page 126

Now, you can run RPG II programs on IBM PCs for only $750.

Bye bye, BABY.

Introducing the Lattice RPG II Compiler for the IBM PC. The new RPG II Compiler is compatible with IBM System III, System/34 and /36. It uses EBCDIC or ASCII files and MS-DOS command language, and has indexed file compatibility with dBase III. And it supports the standard PC keyboard and function keys.

Result: With the RPG II Compiler, you can run or develop RPG II programs on an IBM PC even if you've never operated a PC before.

What's more, Lattice's new compiler costs only $750—much less than similar systems. And there are no run-time royalties. So your first cost is your last.

Try the new Lattice RPG II Compiler. When you compare the price and compare the performance, you'll see why it makes other RPG II compilers cry with envy.

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Glen Ellyn, Illinois 60138
312/858-7950
TWX 910-291-2190

Other utilities available include Lattice Sort/Merge (LSM™), $250; Source Entry Utility (SEU), $250; RPG/SEU/LSM combination, $1100; Screen Design Aid (SDA), $350.

Call for more information about other Lattice RPG Utilities

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††ADDS Viewpoint™, Televideo 910/920/925™, Wyse 50™, and our own Hazeltine 1500, Esprit II and ESP 6110+.

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 124

Prices start at $2,200 for a DC300 tape containing the software driver, hardware interface board and manual. The 4692 Color Graphics Copier costs from $7,795.

Tektronix, P.O. Box 15273, Portland, Ore. 97215.

■

Howtek, Inc. has announced the **Scanmaster**, a flat-bed digital scanner with computerized image processing capabilities.

The Scanmaster is said to scan both full-color and black-and-white images. It offers image and color enhancement, windowing and zoom functions. It scans at 75, 100, 150 or 300 dot/in.

Functions are reportedly host-controlled using ASCII commands via an 8-bit GPIB parallel interface. Hardware configurations supported include IBM Personal Computer bus, Motorola, Inc. VMEbus, Intel Corp. Multibus and Digital Equipment Corp. Q-bus and Unibus, according to the vendor.

Scanmaster has a price tag of $5,995.

Howtek, 21 Park Ave., Hudson, N.H. 03051.

Data storage

Qualogy, Inc. has added a **rack-mount plug-in subsystem** version to its QE-2000 family of enhanced small disk interface (ESDI) storage systems designed for Digital Equipment Corp.'s Microvax and MicroPDP-11 computers.

The subsystem is for 5¼-in. ESDI Winchesters. It comes with one, two or four drives of 310M bytes each, mounted in a chassis. The QE2 controller, external cabling and manual are available separately.

The subsystem costs $8,995 for one drive, $16,795 for two drives and $32,195 for four drives.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131.

■

Extension Devices has announced **Fastbak** disk drives for the AT&T 3B2 system.

The drives can be added in increments of 170M bytes and do not use a feature card or expansion slot. Individual drives can be added to a 3B2 or replace existing internal units. Available options include Fastbak 10M-byte cartridge hard disk drives for backup and mountable files. In multiple drive systems, the controller issues interleaved Seek commands that optimize throughput by avoiding wait states.

A 170M-byte internal kit costs $9,850. A 10M-byte cartridge unit costs $3,750.

Extension Devices, 1807-C W. Braker Lane, Austin, Texas 78758.

■

Wilson Laboratories, Inc. has announced **Wilson-4000E**, a 16-port test system for Winchester disk drives with the enhanced small device interface (ESDI).

The system is said to operate under centralized control of an IBM Personal Computer-compatible microcomputer. It tests all types of Winchester drives with the ESDI specification including 5- and 10-MHz data transfer rates and data strobe and track offset functions.

Digital Testing includes write, read, seek and defect analysis. Analog testing of media locates tracks with output anomalies.

The fully configured Wilson 4000E costs $140,000.

Wilson Laboratories, 2237 N. Batavia St., Orange, Calif. 92665.

■

Sigma Information Systems, Inc. has introduced the **SA-H157** 8-in. Priam drive expansion chassis for Priam Corp. drives.

The 8-in. chassis reportedly supports two 8-in. Winchester disk drives and includes mounting space, power and data cables and rear I/O cable connectors for the drives. The power supply enclosure includes two fans.

The SA-H157 is priced at $1,250.

Sigma, 3401 E. La Palma Ave., Anaheim, Calif. 92806.

■

Hitachi Industrial Division of Hitachi Sales Corporation of America has announced the **CDR-2500S** compact disk/read-only memory drive, which is a stand-alone version of its built-in modem for IBM Personal Computers.

The drive has its own power supply and can be connected as an external component. It utilizes Hitachi's opto-electronics technology and offers 552M bytes of memory capacity and a speed of 200 to 535 rpm for single-sided disks.

The CDR-2500S is priced at $1,100.

Hitachi, 401 W. Artesia Blvd., Compton, Calif. 90220.

Terminals

Hitachi America, Ltd. has announced the **HM-4119** and the **HM-4115** color graphics monitors.

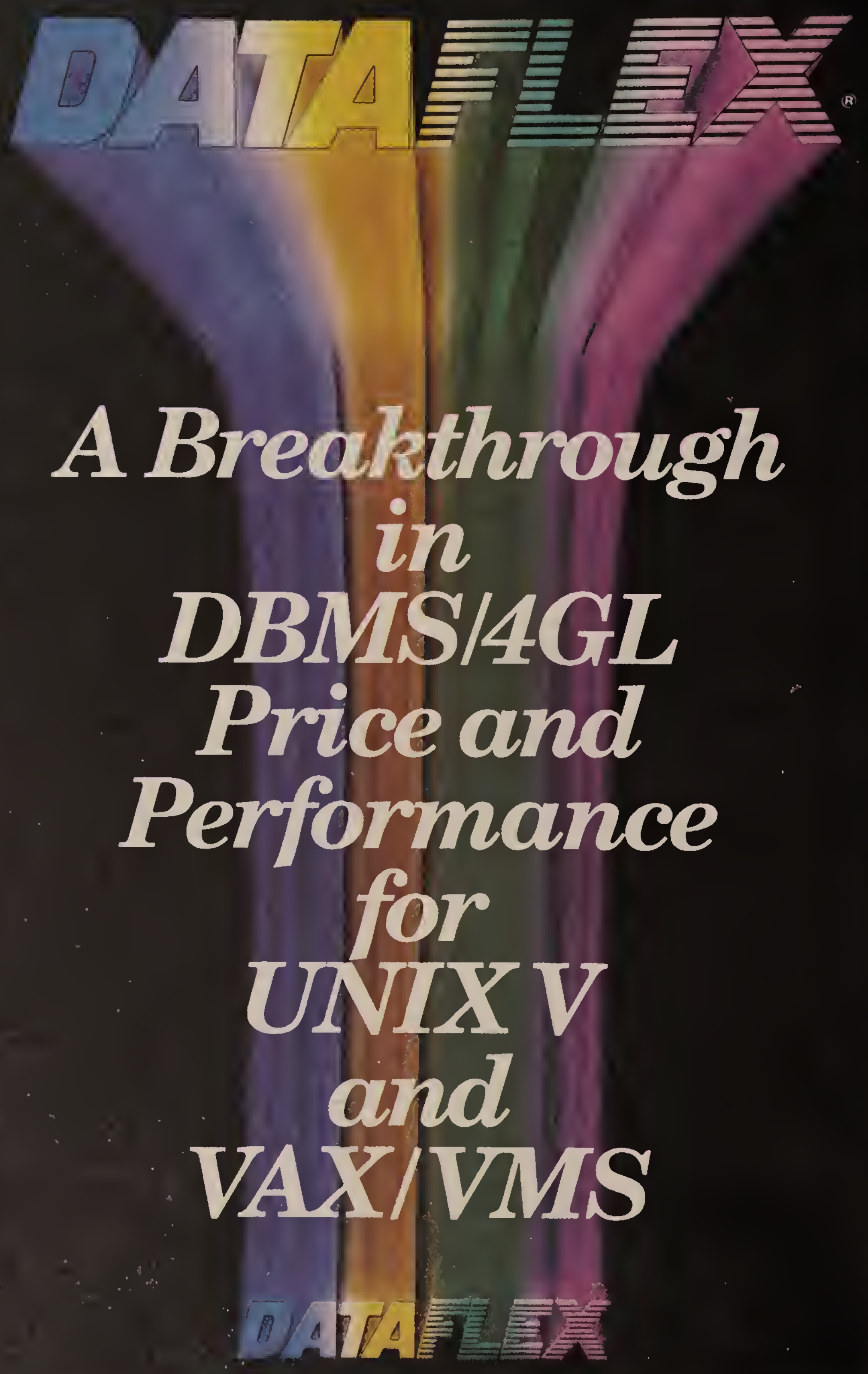
The monitors are said to feature the vendor's elliptical aperture lens and Hitachi slitwinding with auxiliary coil yoke technologies for improved convergence and focus.

According to the vendor, both are 60Hz noninterlace color monitors with a video bandwidth of 100 MHz.

The HM-4119 is said to feature 0.31mm dot trio pitch while the HM-4115 features 0.28mm dot trio pitch.

The HM-4119 is priced at $3,990 and the HM-4115 has a price tag of $2,200.

Hitachi America, Suite 170, 950 Elm Ave., San Bruno, Calif. 94066.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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Ramtek Corp. has announced three **computer interfaces** for its 4200 series of high-resolution graphics display terminals.

The Digital Equipment Corp.-compatible interface provides a parallel, direct memory access (DMA) connection between the 4200 series and the DR11-W, DRV11-W or compatible interfaces, according to the vendor. It costs $750.

The four-port parallel DMA interface to the DEC Microvax uses a single quad slot in the Q-bus. It costs $3,000.

The interface to Ethernet, called Ramnet, allows multiple 4200 series terminals to be driven from a single host interface. The interface is priced at $1,900.

Ramtek, 2211 Lawson Lane, Santa Clara, Calif. 95052.

■

Conrac Display Products Group has announced the **Model 2640 monitor**.

The monitor features 800-line minimum resolution, P45 phosphor standard, 30-MHz video bandwidth and various scan rates.

It offers a switchable reverse-video feature and can display a minimum of 10 shades of gray, according to the vendor.

The unit is available in cabinet and rack-mount configurations. It replaces the vendor's earlier System Network Architecture and 2680 9-in. monochrome monitors.

The Model 2640 is priced at $695.

Conrac, 600 N. Rimsdale Ave., Covina, Calif. 91722.

■

PL Systems has announced the **Datatouch Touch Application Station**, an intelligent touch-screen terminal that provides access to existing keyboard applications.

The touch-sensitive monitor displays an interactive sequence of color screens that allows users to obtain information by touching desired options shown on the screen.

The station connects to the host program as though it were a keyboard terminal.

A Datatouch station consists of a microcomputer, a color touch-screen monitor and a micro-to-mainframe link.

Prices start at $6,000.

PL Systems, 24 Thayer St., Providence, R.I. 02906.

■

Intermec Corp. has announced the **Model 1500** laser scanner for scanning bar code.

The Model 1500, when coupled with an Intermec on-line or portable bar code reader, is able to read low- to high-density bar code up to 13 inches away.

It uses an infrared light source and projects a spot of light that is mechanically scanned back and forth 36 times per second.

The Model 1500 is priced at $1,195.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynnwood, Wash. 98046.

Printers/Plotters

Nissho Information Systems has introduced **printer interfaces** for the IBM 3270 and System/34, 36 and 38 computer systems.

The interface cartridges plug into standard Nissho printers. Each interface has a coaxial cable to allow connection to the controller.

For the System/34, 36 and 38 computers, the printers can be connected directly to the computer system via a twin-axial cable or can function in a remote operation when attached to IBM 5251 Model 12 and 5294 cluster controllers.

The modular interface cartridges are priced at $1,000 each.

Nissho, Suite 100, 10855 Business Center Drive, Cypress, Calif. 90630.

■

Ziyad, Inc. has announced the **Paperjet 400/DSF Dual Sheet Feeder**.

The electronic paper feeder is said to sit underneath the Hewlett-Packard Co. Laserjet and Laserjet Plus printers.

It allows the user to have automatic on-line access to up to three types of stationery; it automatically feeds monarch-size paper for executive correspondence and intersperses different paper sizes and types throughout documents as they are needed for correspondence, graphs and spreadsheets.

The Ziyad Paperjet 400/DSF costs $1,295.

Ziyad, 100 Ford Road, Denville, N.J. 07834.

■

Bruning Computer Graphics has introduced the **Zetadraf 900,** an E-size plotter.

The single-sheet plotter is said to provide speeds up to 45 in./sec. Other features include an 8-pen carriage, built-in memory capability to store up to eight operator set designs, windowing, mirroring and scaling, and a RS-232 or IEEE interface, according to the vendor.

The Zetadraf 900 is priced at $7,950.

Bruning Computer Graphics, P.O. Box 3020, Martinez, Calif. 94553.

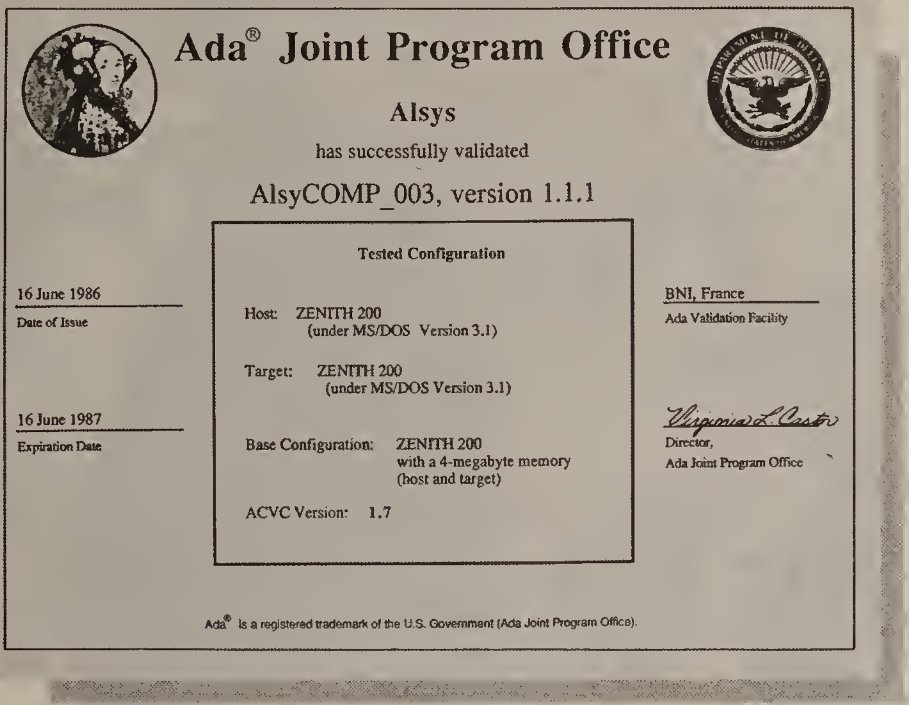
■

Acom Computer, Inc. has announced the **LX3815** 15 page/min. laser printer designed for use with IBM System/34, 36 and 38.

The printer features dual-paper cassettes providing automatic feeding of 250 sheets per tray; direct twin axial attachment to the IBM minicomputer; operation at less than 55

Continued on page 129

Alsys validates Ada* compiler for Zenith Z-248 MS/DOS for government/military users.



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16 June 1986
Date of Issue

16 June 1987
Expiration Date

Tested Configuration

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Target: ZENITH 200
(under MS/DOS Version 3.1)

Base Configuration: ZENITH 200
with a 4-megabyte memory
(host and target)

ACVC Version: 1.7

BNI, France
Ada Validation Facility

Virginia L. Castor
Director,
Ada Joint Program Office

Ada® is a registered trademark of the U.S. Government (Ada Joint Program Office).

Alsys has validated its Ada compiler for the Z-200 series of computers running under MS/DOS, including the Air Force and Navy contracted Z-248. The Ada Compiler, bundled with a 4 MB RAM board, is available in single unit quantities for $2,995.

The compiler, validated at the same time for the IBM PC AT, HP's Vectra, Compaq's Deskpro 286, Sperry's PC/IT, Tandy's 3000 HD and the Goupil/40 can convert general purpose desktop computers to program development workstations using the broadly mandated Ada language.

Programs developed on the Z-248 can run on the Z-120, the IBM PC, and most other PC compatibles.

Alsys is the world's leading Ada company, with other compilers validated for Sun, Apollo, HP and Altos systems.

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Tel: 44 (491) 579090

In the rest of the world: Alsys SA, 29, Avenue de Versailles, 78170 La Celle St., Cloud, France
Tel: 33 (1) 3918.12.44

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The PC-to-host coax connection. She was a good piece of equipment working with coax cable and cluster controllers, but time just passed her by. End users started needing more than simple host access. They also needed their PCs to share resources around the office. That's when local area networks came along to fill the need.

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INS Gateway PC Adapters are engineered around proven INS SNA 3274 cluster controller emulation. A single INS Gateway PC Adapter in an IBM NETBIOS compatible LAN, including Token Ring, will support up to 32 logical unit sessions. The LAN allows each PC on the network to share disks, printers and other resources while the Gateway allows performance of any host-supported function and maintains host access.

INS planned on PCs becoming a major component in the development of information systems. We designed our Gateways to be the logical choice in providing the vital link between LANs and mainframes. We also planned on much more—flexibility, simplicity and reliability. We provide free, responsive user assistance and guarantee every INS Gateway PC Adapter (hardware and software) for five years.

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 127

dba; on-line sharing of printer with the IBM minicomputer and up to four personal computers; and 300 dot/in. resolution.

The LX3815 laser printer is priced at $8,495.

Acom Computer, 3534 Atlantic Ave., Long Beach, Calif. 90807.

■

Compugraphic Corp. has announced the **Intergraph-Imagesetter Interface**, an optional interfacing capability between its 8668 Imagesetter photo output device and Intergraph Corp. systems.

The interface is said to allow Imagesetter to be driven on-line by Intergraph's technical publishing system or any other application system based on Intergraph's Digital Equipment Corp. VAX-based systems.

It allows composed pages of both type and graphics to be produced on either paper or film.

The Interface is priced at $2,000. The retrofit price is $2,500.

Compugraphic, 200 Ballardvale St., Wilmington, Mass. 01887.

■

Houston Instrument has announced the **Scan-Cad** plotter accessory for its DMP-50 series of pen plotters.

Scan-Cad is a scanning input device said to provide a way to input up to E-size drawings into personal computer-based computer-aided design and drafting systems.

It is also said to feature a 200 dot/in. scan head.

Scan-Cad is priced at $2,995.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

■

Texas Instruments, Inc. has announced the **Twinax Interface Option**, a board reported to allow the TI Omni 800 system printers to emulate the IBM 5224, 5226 and 5256 printers in the System/34, 36, 38 environments.

The option board converts the Omni 800 Models 810, 880 and 885 system printers to a twin axial plug-compatible device for direct attachment to the IBM minicomputers, according to the vendor.

The half-size interface board may be factory or field installed.

The Twinax Interface Option is priced at $1,500.

TI, P.O. Box 809063, H-900, Dallas, Texas 75380.

Power supplies

Energy Electronic Systems, Inc. has announced the **Current Things** line of on-line uninterruptible power systems.

Current Things features a digital sine wave for instant backup protection.

Designed to fit between a monitor and a CPU, the units provide constant protection from sags, spikes, brownouts and blackouts, according to the vendor.

The on-line uninterruptible systems are said to come in 400, 550 and 911VA models.

Prices for Current Things range from $899 to $1,599.

Energy Electronic Systems, 9486-8 Deereco Road, Timonium, Md. 21093.

Emergency Power Engineering, Inc. has announced the **Mainframe Power Center** (MPC), said to isolate, distribute and monitor AC power to supercomputers.

The MPC has connections for as many as four high-current loads such as those used by the motor generators of the IBM 3090, according to the vendor.

Between 42 and 126 power poles are available to distribute power to any combination of smaller single-phase and three-phase loads, such as disk drives and printers, the vendor said.

The MPC is mounted on wheels.

Prices for the MPC range from $9,000 to $20,000, which includes cables.

Emergency Power Engineering, 3580 Cadillac Ave., Costa Mesa, Calif. 92626.

Safe Power Systems, Inc. has announced **Model 500**, a backup power unit said to prevent system mismatching.

Model 500 features a self-test function to assure that it is operational at all times. It provides 500W of sine wave power and an overload warning signal and protection from power surges as well as sags.

The 500 offers 1 to 2 msec. transfer time and provides inverter power for computers such as the IBM Personal Computer AT for up to 15 minutes.

Model 500 unit is priced at $795.

Safe Power Systems, 528 W. 21st St., Tempe, Ariz. 85282.

PRICE REDUCTIONS

Pyramid Technology Corp. has reduced the prices of its **98X** and **98XE series** of superminicomputers.

The 98X Model 8118 Isoprocessor Packaged System I features the Model 8108 symmetric dual processor with 8M bytes of main memory and two intelligent terminal processors with 32 RS-232 ports, according to the vendor.

Other features include a 470M-byte disk drive, a color console video display, the vendor's dual-port OSX operating system, a Unix operating system license for 32 users, an optimizing C compiler as well as software documentation.

The new price is $177,850.

The 98XE Model 8114 Packaged System I includes the same processor with 4M bytes of main memory, one intelligent terminal processor for 16 RS-232 ports as well as a Unix operating system license for 16 users, the

Continued on page 130

Trying with a single financial software system to meet the competing needs of two departments often comes down to a knock-down, drag-out brawl. Satisfying one group usually means compromising the needs of the other. In the end, neither group gets exactly what it wants.

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San Francisco, California 94105
(415) 495-8811

NEW PRODUCTS/PRICE REDUCTIONS

Continued from page 129

vendor said.

It now costs $134,950.

Pyramid Technology, P.O. Box 7295, 1295 Charleston Road, Mountain View, Calif. 94039.

■

Ven-Tel, Inc. has reduced the prices of its modems for the IBM Personal Computers and compatibles.

The Half Card internal 1,200 bit/sec. modem costs $399. The 1,200 Plus external 1,200 bit/sec. modem costs $349.

The Half Card 24 internal 2,400 bit/sec. modem is now priced at $599. The 2,400 Plus external 2,400 bit/sec. modem now costs $599.

The Half Card internal 1,200 bit/sec. modem without communications software costs $275, and the Half Card 24 internal 2,400 bit/sec. modem without communications software is priced at $475, according to the vendor.

All Ven-Tel modems are said to be Hayes Microcomputer Products, Inc. compatible.

Ven-Tel, 2342 Walsh Ave., Santa Clara, Calif. 95051.

■

Intuit has announced a price reduction for its **Quiken** financial software program that was designed to run on Apple Computer, Inc.'s Apple II series of personal computers as well as on IBM Personal Computers.

Quiken is said to automate bill-paying, maintain a check register, track expenses and bank statement reconciliation, according to the vendor.

The product is said to have the capability to transfer data directly to Lotus Development Corp.'s 1-2-3 and Symphony.

Quiken software is now priced at $49.

Intuit, 540 University Ave., Palo Alto, Calif. 94301.

■

C. Itoh Electronics, Inc. has reduced the price of its laser-optic **Filing System** and of its **Lips 10** laser printer.

The Filing System is said to be a turnkey electronic filing cabinet that uses optical-disk storage to handle large volumes of information, thereby allowing access to that stored information.

The Lips 10, which is a 10 page/min printer, features a 600,000-page life cycle and an average monthly use of 15,000 pages, according to the vendor.

The Filing System is now priced at $94,500.

The Lips 10 laser printer costs $2,995.

C. Itoh, 19300 Hamilton Ave., Torrance, Calif. 90248.

■

Wyse Technology, Inc. has announced a price reduction for its **WY-60** ASCII terminal.

The WY-60 includes a 14-in., flat-screen CRT in green-amber or white phosphor.

Also included is a 7- by 12-char. matrix in a 10- by 16-char. cell with 3-dot descenders.

The terminal features 44 or 26 lines of text in an 80- or 132-col. format, respectively, and up to seven pages of local display memory.

The WY-60 terminal is now priced at $599.

Wyse Technology, 3040 N. First St., San Jose, Calif. 95134.

■

Software Results Corp. has announced price reductions for its **HASP/VMS Q-bus** and **SNA/VMS Unibus** Comboard systems.

Both Comboard systems are said to be complete hardware and software interconnects that permit users of Digital Equipment Corp. computers to communicate with IBM and other central mainframes.

The HASP/VMS Q-bus Comboard system is now priced from $3,500 to $9,500 and the SNA/VMS Unibus Comboard system now costs from $4,500 to $15,500.

Both include Sendplus software for the Comboard host node and one additional node.

Software Results, 2887 Silver Drive, Columbus, Ohio 43211.

■

Realworld Corp. has lowered the price of its **4-in-1 Basic Accounting** software package.

The software combines accounts receivable, accounts payable, general ledger and payroll.

It also offers an automated installation procedure, on-line Help and documentation.

Available for IBM Personal Computers and compatibles, 4-in-1 Basic Accounting now costs $595.

Realworld, 282 Loudon Road, Concord, N.H. 03301.

■

Sigma Information Systems has reduced the price of its Digital Equipment Corp. Q-bus Storage Module Drive (SMD) disk controller, the **SDC-RQD11-SC**.

The controller was designed to interface two physical SMD-type disk drives to the Q-bus via DEC's Mass Storage Control Protocol. The drives may be of mixed capacities and transfer rates with either fixed or removable media.

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COMPUTER INDUSTRY

Section begins on page 154

Intelogic Trace faces stiff year ahead in maintenance arena

CEO resigns after sharp drop in profits, revenue

By James A. Martin

SAN ANTONIO — Intelogic Trace, Inc., the third-party computer maintenance concern spun off last year from Datapoint Corp., faces a difficult year ahead with both increasing competition and decreasing sales from its main revenue base — the service of Datapoint equipment.

Once thought to be a strong contender in a growing industry, Intelogic Trace last week reported a sharp decline in net earnings and revenue as well as the resignation of its president and chief executive officer, John L. Hale. Hale's sudden, unexplained departure came one day after the financial results were announced.

Amid the company's changes at the top, analysts are not optimistic about the firm's chances for success in the increasingly competitive third-party maintenance business.

"When the company was created, there were no marketing or sales efforts or any of the things that make it a true company," said Donald F. Blumberg, president of D. F. Blumberg & Associates, industry consultants. "Management seems to think all they have to do is put out their shingle and say they're in business, and the customers will come. It won't work that way."

The company's net income for first-quarter 1987 was $2.5 million, or 14 cents a share, a sharp drop from $5.2 million, or 26 cents per share, in the same quarter a year ago. Revenue was $34.8 million, compared with $39.5 million.

Intelogic Trace said last week that Hale resigned, effective immediately, to "pursue personal interests," but a source close to the company said the timing of his resignation with the dismal first-quarter report was "not by coincidence."

> **"**
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> ***Amid the company's changes at the top, analysts are not optimistic about the firm's chances for success in the increasingly competitive third-party maintenance business.***

Replacing Hale is Clark R. Mandigo, a member of Intelogic Trace's board of directors and president of BHP Petroleum, Inc. Mandigo has no experience in the computer maintenance industry but was chosen on the merits of his management skills, according to Philip D. Freeman, vice-president and general counsel of Intelogic Trace.

Intelogic Trace needs strong leadership and marketing efforts now more than ever to overcome declining revenues and income. "The problem is that 95% of their revenues are dependent on the success of Datapoint, and that will remain true for some time," said D. R. MacNaughton, president of Business Development International, a consulting firm.

"So, it's a situation where the success of one company is totally dependent upon another," MacNaughton continued. "Intelogic Trace can only hope Datapoint begins to do well and that they get other customers as well. Mandigo has his work cut out for him."

Datapoint, however, continues to post operating losses. Although its red ink was significantly reduced from $8 million in the year-earlier quarter, it still lost $4.5 million in the recently ended quarter. Revenue fell slightly from $73.8 million to $71.4 million.

Intelogic Trace is concentrating its efforts to expand its product support to other vendor's CPUs, such as the IBM System/34 and 36, and to widen its marketing efforts, according to Freeman.

Results of those efforts will not be reflected in the company's financial reports until next year, he added.

Concern about appointment

While analysts agreed Intelogic Trace needs to concentrate on marketing if it is to succeed, they expressed concern over Mandigo's appointment.

"If I were on the board of directors, I would be more comfortable with someone experienced in the industry," MacNaughton said.

"Mandigo's experience may not include the marketing of services, which is what Intelogic Trace needs to develop, and there's a great deal of difference between marketing a product and marketing a service," Blumberg said.

But Freeman defended Mandigo's selection, saying, "We have a solid cadre of people with technical expertise. The one area we wanted to strengthen was management, and Mandigo brings a strong ability of looking at the broad view of where we want to go."

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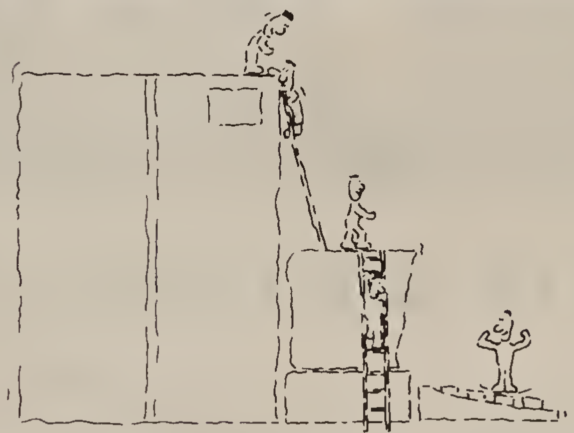

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T-Bar flees hostile suitor, agrees to $57M Data Switch buy

By Stanley Gibson

WILTON, Conn. — Fleeing the grasp of a hostile suitor for the arms of a friendly one, matrix switch vendor T-Bar, Inc. recently said it has agreed to be acquired by Data Switch Corp. in a transaction valued at $57 million. The purchase is scheduled to be completed in the first quarter of 1987.

The friendly takeover, at $8.25 per share, follows a hostile bid for T-Bar from John Beall and Co. in North Bergen, N.J., for $7.25 per share. T-Bar's board of directors rejected the Beall offer as inadequate, but a Beall executive said he would not rule out the possibility that Beall may come back with an offer higher than $8.25.

"We couldn't determine where the money was coming from in the Beall offer, but the money was coming from some other party," said A. Henry Morgan, chairman and chief executive officer of T-Bar. "The merger with Data Switch makes excellent business sense and is in the best interest of T-Bar's security holders, customers and employees."

In response to a suit filed by T-Bar, the Federal District Court of Maryland has enjoined Beall from proceeding with its offer, pending disclosures relating to one of its financing sources, George Soros, a Beall co-owner. Purnendu Chatterjee, president, chairman, CEO and co-owner of Beall, said his company has not yet determined whether it will make an offer greater than Data Switch's but said if it does, it will disclose all the data mandated by the court concerning Soros's finances.

Chatterjee said his company's offer is financed with a loan of $25 million from Citicorp, a $15 million margin loan and $10 million in equity investment from Soros.

T-Bar primarily makes matrix switches for data processing and data communications users. Shelton, Conn.-based Data Switch makes data processing and data communications switching and control systems, network monitoring systems and IBM mainframe channel extenders. Beall makes IBM mainframe channel extenders.

A merger of Data Switch and T-Bar raises antitrust questions, Chatterjee said, claiming that the combined firm would virtually control a small market.

Rudolph G. Morin, senior vice-president of finance for Data Switch, said his company will offer about $12 million in cash, borrow another $40 million and put up the remainder of the $57 million total in stock to finance the acquisition. Drexel Burnham Lambert, Inc. has committed to providing the $40 million.

The agreement, which has been approved by both companies' boards of directors, states that Data Switch will make a tender offer of $8.25 per share to purchase up to 70% of all outstanding T-Bar shares and shares issuable upon conversion of T-Bar's 9% convertible subordinated debentures. The offer will be followed by a merger in which the remaining shareholders will receive Data Switch common stock worth $8.25 per share.

One source close to both companies, however, noted that T-Bar is leaving the door open for an acquirer, conceivably Beall, that might offer more than $8.25 per share. "T-Bar is being somewhat coy," he said. "I'm not sure why T-Bar is more comfortable with Data Switch than with Beall. It may be that Data Switch execs came from T-Bar."

The source also raised questions about compatibility in the two companies' products and in corporate cultures. Data Switch and T-Bar have been tough competitors until now, he pointed out. "The product overlap is pretty serious. The differences in architectures will have to be reconciled," he said.

For the first nine months of 1986, T-Bar had revenue of $32 million and earned $795,000, or 19 cents per share. Data Switch reported revenue of $30.4 million, earning $1.7 million, or 17 cents per share. Beall had revenue of about $3 million last year.

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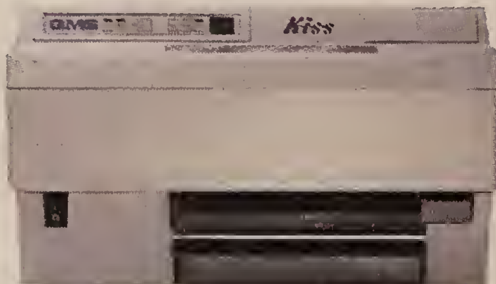

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Lawsuits test link between vendors, maintenance firms

DEC, HP involved in separate actions

By Clinton Wilder

The often strained relationship between hardware vendors and independent computer maintenance firms is currently being tested in two lawsuits involving leading minicomputer makers — one as the plaintiff and one as the defendant.

Digital Equipment Corp. recently filed a copyright infringement suit against a small Maryland-based servicer of VAX computers, while Hewlett-Packard Co. is proceeding with its defense against a California maintenance firm that has sued HP for unfair and monopolistic business practices.

In both cases, the independent maintenance firms allege that the vendors are willfully attempting to drive them out of business — a feeling shared by many service firms and some users regarding hardware vendors [CW, Oct. 21, 1985; Jan. 27, 1986].

In the California case, Datagate, Inc. in Milpitas is seeking about $35 million in damages from HP, charging that in 1983 HP reversed a longstanding policy of cooperation with third-party service firms. Later this month, HP founders William Hewlett and David Packard and President John A. Young will give depositions in the case.

Restricted access

Datagate alleges that HP, which formerly provided parts support, training and a one-day parts hot line to Datagate, began to change its policy, restricting Datagate's access to HP's parts. Datagate claims HP violated the Sherman Act by using its monopolistic position to restrict competition in the market for maintaining HP computers. HP controls about 94% of that market, according to Datagate attorney Ron Katz.

The Datagate-HP suit is considered one of the computer industry's first legal test cases of the controversial issue of vendor cooperation with third-party firms, sometimes known as independent service organizations. As competition for service dollars has intensified and many large systems vendors have entered the third-party business, several have taken an increasingly hard line on what they consider helping their competitors.

Datagate's key challenge is to prove that HP's change in policies dampened competition in the entire market and not just for Datagate, according to W. James MacNaughton, a Morristown, N.J., attorney who follows legal issues in the maintenance industry.

"We are trying to establish what the rules of the game are," Katz says. "If HP can just cut us off, there won't be any more independent service organizations. HP wants to nip this business in the bud." Katz claims that HP's policy change coincided with Datagate's rapid growth in the marketplace.

Datagate, a closely held, 8-year-old firm, services HP gear for government and military customers and some large commercial accounts, including TRW, Inc., General Electric Co. and General Dynamics Corp.

In the Maryland case, defendant DSI Computer Services, Inc. also claims that DEC is trying to drive it out of business, but by using its legal muscle. Late last month, DEC filed suit against DSI to seek an injunction prohibiting the service firm from using allegedly pirated DEC diagnostic software in its maintenance of VAX/11-730, 750, 780 and 785 systems.

"It's just a hard sales tactic," says Joe Collazo, a DSI engineering sales executive. "DEC is trying to discredit us so the business doesn't go our way."

Like Datagate's charge against HP, DSI claims that DEC is attacking the service firm because it has been successful winning business, particularly the service component of government bids, from the hardware vendor. Collazo says that all of DSI's customers formerly paid for maintenance directly from DEC.

"As an alternative maintenance firm, we stimulate the government service market," Collazo says. "We force the agencies to go out to bid for maintenance." DSI, a 7-year-old firm based in Lanham, Md., was acquired by American Express Corp.'s First Data Resources subsidiary in August.

Collazo claims that DSI only uses DEC's diagnostic software when it has been licensed on the customers' systems; in other cases, according to Collazo, DSI uses a diagnostic package from TRW.

DEC has charged, however, that DEC employees found unlicensed copies of its software installed on customers' machines, and the customers told them it had been installed by DSI.

"We asked DSI to cease the practice, and that did not occur," says DEC spokesman Jef Gibson. "There is nothing wrong with a customer choosing third-party maintenance, but in this case these are unlicensed copies of our software."

Gibson says DEC has encountered similar situations with other independent service organizations but has resolved them out of court and under nondisclosure agreements.

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Computer slump hits Japan; strong yen hurts overseas sales

Vendors institute cost-cutting measures

By Takehisa Kondoh

TOKYO — As the Japanese yen continues its rapid appreciation against the U.S. dollar, the computer industry has become one of the hardest hit sectors in Japan, suffering heavy losses in overseas sales. With no signs of restoring export levels at any time soon, a number of vendors have opted to retrench.

Cuts in salaries and fringe benefits for executives and managers have already been introduced at Hitachi Ltd., Mitsubishi Electric Corp., Toshiba Corp. and Fuji Electric Co.

At Hitachi, for example, about 6,800 managers have agreed to an average 5% pay cut for the October through March period, responding to a move by 60 top officials, including President Katsushige Mita, to refund 10% of their executive compensations.

Most recently, Hitachi, whose 1986 mid-year profit plummeted 46% from a year ago, also resorted to a halt on overtime pay for its 80,000 employees.

This companywide effort is estimated to save Hitachi $2.48 million a month.

Hitachi's consolidated sales for the first half of fiscal 1986, ended Sept. 30, registered a decrease of 4% from last year, while net income for the period was down 46%.

Net income for the period was $291 million, compared with $542 million for the same period last year. Sales for the six-month period were $15.2 billion.

While Hitachi's major product divisions showed mixed results, the electronics sector posted reasonable growth, thereby compensating for the setback suffered by semiconductor operations.

As a result, the division maintained about the same level of performance as in the preceding year, Hitachi said.

In addition to requesting pay cuts, Hitachi and other vendors are trimming inventories by redeploying the production work force.

A Hitachi spokesman said that approximately 500 of the company's manufacturing employees will be temporarily transferred to clerical jobs during the latter half of this year.

To date, it seems unlikely that any leading computer or electronics vendor will take the extreme step of laying off employees — an alternative that has not been adopted by the Japanese electronics industry since the post-oil shock of 1975.

For the past 18 months, the yen has gained about 34% in value against the dollar, generating huge foreign exchange losses for vendors of electronics and other export-dependent products.

For the mid-year term, which ended in September, the costs of changes in the foreign exchange rates snowballed to $198.8 million at Hitachi, $434.8 million at Toshiba and $124.2 million at Mitsubishi.

Tetsuro Kawakami, president of optical fiber maker Sumitomo Electric Industries, said of the foreign exchange adversity, "We got a body blow. Its ripple effects are far-reaching."

Computer firms take hardest blow

Industry figures underscore more serious damages in the computer and electronics sectors than in other manufacturing industries. For the first half of this year, annual profit declines at Japan's 46 largest computer and electronics vendors averaged 58.4%, compared with an average of 48.2% in other manufacturing sectors.

With the increase in belt-tightening measures, computer industry insiders expressed concern that vendors' research and development may slip.

Already, microchip divisions of the nine largest computer vendors, except Toshiba, were forced to curtail their investment plans for this year, with a combined decrease in investment of 43.8% from 1985 levels.

Kondoh is Asian bureau chief of the CW Communications International News Service.

Compaq to build its first European plant in Scotland

HOUSTON — Compaq Computer Corp. has announced it will build its first European manufacturing facility in Erskine, Scotland.

The company plans to invest $23. million in a facility to produce portable and desktop personal computers, including the new Compaq Deskpro 386 system. Compaq expects to employ 350 people at the plant, which will have 100,000 square feet of operational space by the fourth quarter of 1987 and a total of 200,000 square feet over the next four years.

Compaq recently announced its first non-U.S. production facility — an assembly plant in Singapore.

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Perot wins again . . .

From page 154

were questioning the wisdom of the buy-out offer.

At this writing, the United Auto Workers are probably not far behind — rabble-roused by Perot's public comment that GM could build "a spanking new car plant," creating thousands of new jobs, with the check made out to H. Ross Perot.

Perot, a successful businessman, knows full well that corporate financial accounting is not that simple and that GM is not diverting operating or capital expenses to fund this deal. But he also knows that the general public doesn't know that. So what better way to win this latest PR round against nemesis Smith than to "generously" suggest that GM could find a better use for its money than bankrolling Perot's Christmas shopping?

The media is portraying the battle exactly as Perot wants it: Perot, the Dallas entrepreneur, superpatriot, friend of the prisoner-of-war and (have to chuckle at this one) of the laid-off GM working stiff, against the stuffed-shirt, old-line, chauffeured-limousine types in their stodgy 14th-floor enclave in Detroit. Perot's legendary 1979 rescue of EDS employees from Iran only adds to the image.

In this skirmish of images, EDS itself is somehow portrayed as a progressive, 1980s high-tech outfit purchased by GM to lead the auto giant into the information age.

What has been ignored, or at least overlooked, is the way Perot built his modern computer services firm on distinctly 19th century labor principles.

EDS's poor record on employee salaries and benefits, promotion of women and minorities and strict behavior regulation is notorious in the data processing industry. It is a safe bet that most EDS low- and mid-level employees would tell the media that Ross Perot is no friend of the working man — except they would probably be fired for doing so.

It is also ironic that the founder of EDS, with his infamous reputation for playing stonewall and closed-mouth with the press, would be so skillful at media manipulation in the GM affair. But then again, Ross Perot once looked pretty good to Roger Smith, too.

The odds seem pretty strong that one week from today, Perot will take his $750 million out of escrow and add it to his multibillion-dollar fortune. And, like some medieval brotherhood, the GM directors will repair back to their boardroom with their company's cash load a bit lighter but with consensus and harmony restored.

Just what the future holds for EDS is uncertain, but the power pendulum is sure to swing toward those who want to cut GM's DP costs and away from those who want to maximize EDS's profits.

But in the analysis of who won the public battle of perception last week, the answer is easy: The guy who walked away with $750 million while criticizing the people who gave it to him.

Apple exec: Take care of employees

Or else U.S. may lose high-tech edge

By Peggy Watt

SAN JOSE, Calif. — Even the wunderkind high-tech industry must take care not to fall into the same labor and management pitfalls as some older businesses, a top Apple Computer, Inc. executive warned in a recent speech.

Apple Vice-President of Product Development Jean-Louis Gassee told his audience that the U.S. computer business risks losing its technological edge by misreading high-technology workers and not fully recognizing them as resources.

The roots of the problem, he said, are in a widely disparate educational system, and it branches to management that still treats its ranks of professional high-tech workers as if they were blue-collar labor.

Gassee made the comments as the featured speaker at a recent program called "Worldwide Challenge to American Business," co-sponsored by the Peninsula chapter of the World Affairs Council of Northern California and Techmart, Silicon Valley's marketing center, which is still under construction.

"Silicon Valley is an exaggeration of those virtues and the vices of our society," said Gassee, who came to the U.S. 1½ years ago from the top post of Apple France. Gassee's transfer was part of the corporate reorganization that saw the departure of founder Steve Jobs and left John Sculley as chairman and president redirecting the company.

While he declared, "America is still the best place in the world to work," Gassee also proposed a threefold challenge to high-tech industry: deal with slips in technological leadership, meet educational needs and improve management attitude toward employees.

> ”
>
> ***'The literacy standards provide arguably the best college system, but the gap is widening between the educated and not educated.'***
>
> — Jean-Louis Gassee
> Apple Computer, Inc.

Gassee's motto for the U.S. high-tech industry has long been "to beat the Japanese at our own game, not at their game," and he maintains a new approach must match the new industry to achieve that.

"It's like dieting. Everybody knows what to do, yet we don't do it," he said.

Silicon Valley typifies the challenge, according to Gassee.

"It forces the issue because there are more white-collar workers than many places in the country, and we have the technological problem and the problem of finding educated people to work for us," he said. He called education both a problem and a solution to the challenge to keep technological leadership.

"The literacy standards provide arguably the best college system in the world, but the gap is widening between the educated and not educated," he said. "And a teacher is paid less than a used car salesman. I find that distressing."

Furthermore, too many corporations treat those educated, professional "new-collar" workers the same way they treated the skilled and unskilled labor forces of the past, Gassee said.

"The mindset about white-collar workers is still very much blue," he said.

"We're going to split our resources with the lack of trust between management and white-collar workers. That's bad, because the real assets of any corporation walk through the elevator doors every morning. It is incumbent upon ourselves to make the workplace better."

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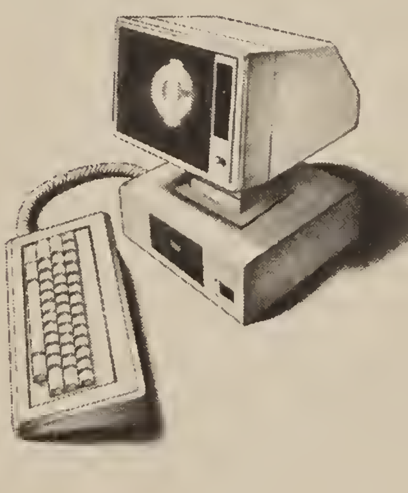

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Datapoint Corp. announced revenue for the quarter ended Nov. 1 of $71.4 million, compared with $73.8 million a year ago. Net loss was $4.5 million, or 25 cents per share, compared with a net loss of $8 million, or 45 cents per share, in the previous year.

■

Sterling Software, Inc. reported revenue for the year ended Sept. 30 of $233.8 million, compared with $62 million in the previous year.

In the fourth quarter, Sterling took a one-time charge of $4.5 million for the premium required to prepay its high-cost debt, relative to the acquisition of Informatics General Corp. This resulted in a net loss of $2.5 million, or 28 cents per share, for the quarter. For the year, net income was $3.8 million, or 25 cents per share.

Income from operations for the year was $8.2 million, or 84 cents per share, compared with $3 million, or 47 cents per share, last year.

For the fourth quarter, revenue was $48.9 million, compared with $43.3 million one year ago. Profits from operations were $1.2 million, or 21 cents per share, compared with $1.5 million, or 17 cents per share, in the same quarter a year ago.

■

Pansophic Systems, Inc. announced revenue for the second quarter ended Oct. 31 of $24.3 million, compared with $19.6 million for the same period a year ago. Profits were $3.6 million, or 42 cents per share, compared with $3.3 million, or 39 cents per share, in the comparable period a year ago.

■

Concurrent Computer Corp. reported net income for the first quarter ended Oct. 31 of $1.1 million, or 10 cents per share, compared with $2.4 million, or 25 cents per share, a year ago. Revenue was $54.2 million, compared with $63.2 million in the first quarter of last year.

■

Policy Management Systems Corp. announced revenue for the third quarter ended Sept. 30 of $39.7 million, compared with $25.7 million a year ago. Profits were $3.6 million, or 22 cents per share, compared with $3.5 million, or 22 cents per share, in the same period a year ago.

■

Infotron Systems Corp. announced revenue for the third quarter of $20.9 million, compared with $17.2 million in the previous year. Profits were $518,000, or 10 cents per share, compared with $394,000, or 8 cents per share, last year.

■

The MacNeal-Schwendler Corp. reported revenue for the third quarter ended Oct. 31 of $19.7 million, compared with $15.2 million a year ago. Profits were $5.1 million, or 84 cents per share, compared with $3.6 million, or 58 cents per share, in the comparable period a year ago.

■

DSC Communications Corp. announced net income for the third quarter ended Sept. 30 of $5.9 million, or 14 cents per share, on revenue of $70.8 million. This compares with a net loss of $13.7 million, or 34 cents per share, on revenue of $68.1 million in last year's third quarter.

■

Computer Memories, Inc. announced revenue for the quarter ended Sept. 30 of $348,000, compared with $39.2 million in the year-earlier period. Profits were $245,000, or 2 cents per share, compared with $2.8 million, or 25 cents per share, in the like period a year ago.

■

Archive Corp. reported revenue for the year ended Sept. 26 of $78.8 million, compared with $57.8 million a year ago. Profits rose 96% to $2 million, or 19 cents per share, compared with $1 million, or 10 cents per share, in the previous year.

Revenue for the fourth quarter was $18.2 million, compared with $17.7 million in the fourth quarter of last year. Due to a previously reported one-time write-down of the value of its inventories, the company reported a net loss in the fourth quarter of $845,000, or 8 cents per share, compared with a profit of $538,000, or 5 cents per share, for the fourth quarter of last year.

■

Dataram Corp. announced revenue for the second quarter ended Oct. 31 of $4.3 million, compared with $4.4 million last year. Profits were $280,000, or 14 cents per share, compared with $827,000, or 41 cents per share, in the same period last year.

■

Timeplex, Inc. announced revenue of $33.3 million for the first quarter ended Sept. 30, representing a 15% increase from revenue of $29 million for the first quarter of last year. Net income was $7.6 million, or 81 cents per share, compared with $3 million, or 34 cents per share, in the like quarter a year ago.

■

System Industries, Inc. announced revenue for the first quarter of fiscal 1987 ended Oct. 26 of $29.5 million, compared with $23.5 million a year ago. Profits were $1.2 million, or 24 cents per share, compared with $655,000, or 15 cents per share, in the like period a year ago.

■

Trilogy Ltd. reported an operating loss of $3.2 million in the third quarter ended Sept. 28. The sale of Trilogy's technology operations to Digital Equipment Corp. resulted in a consolidated net profit of $1.7 million, which compares with a net loss of $12.5 million in the third quarter of 1985. Revenue was $4.5 million, compared with $7.3 million in the same quarter a year earlier.

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Federal aid crucial to chip makers as Japan gains strength

OUTSIDE LINES
Bohdan O. Szuprowicz

There is a growing realization in the U.S. that it is unrealistic to try to compete in the semiconductor industry on a free market basis. Governments in Europe, Japan, South Korea, India, China, Brazil and other countries subsidize development of domestic semiconductor industries in some form. Those governments perceive semiconductors as critical to survival in international markets and indispensible to creditable military power projections.

The immediate objectives of those countries are to protect domestic markets for as many semiconductor products as possible and export surplus production primarily to the U.S. The U.S. is expected to remain the largest consumer of all types of semiconductors for many years.

The announcement by Japan's Fujitsu Ltd. that it will merge with Fairchild Semiconductor Corp. may have tipped the balance of informed opinion in favor of more drastic action. Chip manufacturers in the U.S. are now embarking on an initiative to combine industry and government resources to preserve U.S. competitiveness in microchip production.

Members of the Semiconductor Industry Association have proposed to organize a manufacturing consortium that would create and operate a prototype semiconductor superplant to manufacture the most advanced microchips and provide such technologies to American manufacturers. Sematech, as the manufacturing consortium would be known, is to be a supermodern microchip factory costing several hundred million dollars to build. It would contain the most advanced equipment, manufacturing technology, software and personnel and would most likely focus initially on advanced memory microchips in the 1M-bit and higher categories.

The costs of modern very large-scale integration (VLSI) and ultra-large-scale integration (ULSI) semiconductor plants are already much higher than $100 million, which means that few governments or foreign cartels would be in a position to match such an investment.

U.S. semiconductor manufacturers expect to convince the Reagan administration that the cost of setting up Sematech should be shared by industry and government agencies. The National Security Council and the Defense Science Board are already studying the issue, and the Pentagon is expected to be a major backer. The national security aspect plays an important role because VLSI and ULSI high-speed random-access memory microchips are crucial to the development of smart weapons and Strategic Defense Initiative projects. The U.S. Department of Defense cannot tolerate dependence on foreign suppliers for such critical products.

Under the provisions of the 1950 Defense Production Act, the DOD is also permitted to stimulate new industries by guaranteeing a market for militarily crucial products. The DOD has already invoked this act in an effort to reduce extensive U.S. dependence on foreign suppliers in the market for basic pure silicon. That market is dominated by West Germany, which has a major plant only miles from the Czechoslovakian border .

> ”
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> ***Latest moves by the Japanese built an industry consensus leading to action.***

The prototype superfactory is expected to be a total manufacturing system serving all U.S. semiconductor manufacturers. Its high production volume would provide economies of scale unobtainable by individual producers, giving a boost to many semiconductor firms that find it increasingly difficult to compete with offshore suppliers.

Experts believe that Silicon Valley has five to six more years to convince legislators to create more competitive operating conditions for U.S. semiconductor manufacturers. The latest moves by the Japanese and continued alleged dumping of Japanese semiconductor products in third countries despite a recent agreement to desist have helped build an industry consensus that is leading to action.

Chip vendors are now demanding new legislation providing preferential tax treatment, provision of low-cost loans, cheaper capital and relaxation of antitrust regulation. The creation of more favorable operating conditions is deemed mandatory to prevent complete Japanese dominance of an industry that originated in the U.S. and promises to become a $200 billion giant by the end of the century.

Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

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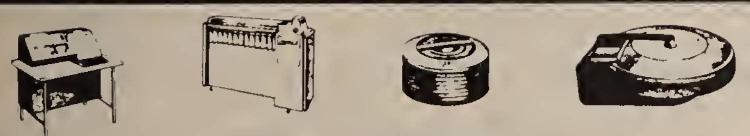

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ORDER FORM

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Issue Date: Ads can be accepted up until the Monday preceding the issue desired. **Computerworld** comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be cleanly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is **$178.00*** (One unit minimum and no fractional units allowed.) There are no agency commisions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

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Classification:______________________
Name:______________________
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Company:______________________
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Send this form to:

COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
617-879-0700 **800-343-6474**

* Reflects 1987 price increase, effective December 29, 1988.

The Bulletin Board

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- The Bulletin Board is designed to advertise only one piece of equipment or software per unit.
- Units are one column wide by one inch deep at a cost of $178.00* per column inch. Although several units may be purchased for one advertisement, there will be no quantity discount.
- All ads are standard in format and typeface. No special typeface, borders or logos are allowed. Copy may be up to 25 words per unit.
- The Bulletin Board ads are listed by manufacturer or by product type under appropriate headlines.
- Ads are set on a six-column page in our classified section under "The Bulletin Board".

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  The first line is set in larger, bold type and should contain standard equipment identification.
  The body copy should describe the equipment and state the price.
  The closing should supply the seller's name and telephone number.
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- Deadline is 7 days in advance of Monday issue.
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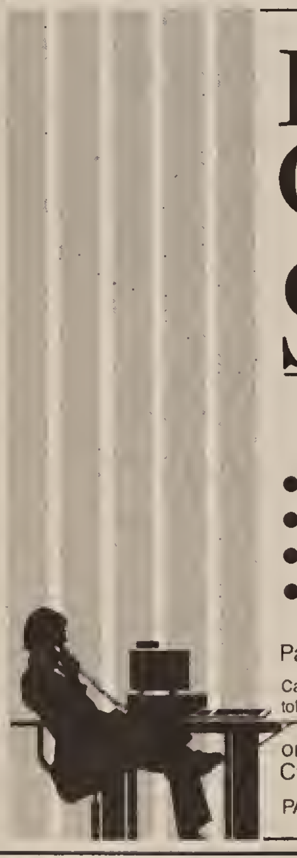

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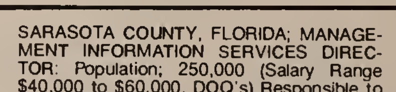

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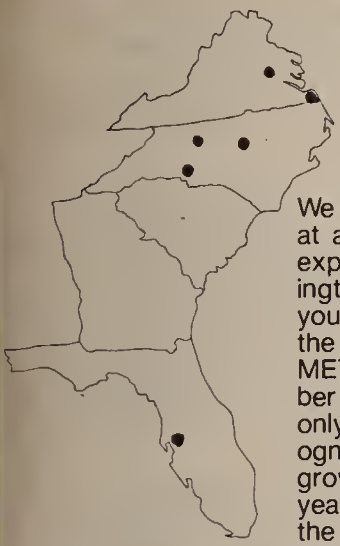

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EDS departures to help GM ties

From page 154

in the computer services business. The loss of EDS's top executives and corporate identity will, in the short term, make its efforts outside of GM more difficult, he added.

"Where the rubber meets the road is in the integration process, internally, and his [Alberthal's] ability to attract and retain talent," Jastrzembski remarked.

Tom Lawton, publisher of "Computer Services Report" in Belmont, Mass., said he believes the moves will have little effect on EDS customers outside of GM, who accounted for roughly 25% of the firm's $1.12 billion third-quarter revenue. "A lot of people are watching to see what will happen. Those entering into new relationships with EDS are bound to be cautious. Those with ongoing relationships should not expect any changes," he said.

Customers outside GM last week said they did not expect any change in their working relationships with EDS. "Our contract is with EDS; we never dealt with Ross Perot," noted Ken Vagts, director of automatic data processing services at the Department of Energy's Energy Information Administration in Washington, D.C. "EDS is an on-site contractor, and I don't foresee any changes." EDS has had a contract with the DOE to run the agency's computer center since January 1984, Vagts declared. The one-year pact will expire in January 1989.

The Massachusetts Registry of Motor Vehicles, which signed a $12 million contract with EDS two years ago to install an on-line license and registration system, also does not expect last week's events to influence its relationship with its vendor. "EDS is EDS as long as they do what they've contracted to do," said George Dooley, chief deputy registrar. "I wouldn't care if they're owned by GM or AT&T for that matter."

An EDS spokeswoman said the departure of the four executives, Perot, Vice-Chairman Morton Meyerson, Thomas Walter and William Gayden, would not hurt the firm, since none is involved in daily operations. She called the integration of EDS into a business unit including Hughes Aircraft Co., Delco Electronics Corp. and GM's defense operations a bureaucratic restructuring that would not change the way the firm operates. "We still will aggressively pursue business opportunities outside of GM and perform the activities required for GM," she said.

Perot's acceptance of an offer to sell his shares back to GM for $750 million and to step down from GM's board of directors came in the wake of reports that the No. 1 auto maker had discussed selling part or all of EDS to AT&T. Reportedly, Perot's public criticism of GM management and its administration of EDS caused a rift with Smith, which led to the auto maker's offer to buy back all of Perot's shares.

Perot said he put the $750 million in an escrow account, giving GM until Dec. 15 to reconsider its buyout decision. He will, however, be a consultant to EDS and hold the title of company founder.

As part of his financial separation from EDS, Perot signed an agreement not to start a competing company for three years.

MCI trims costs, work force

From page 154

MCI spokesman Gary Tobin.

Write-downs on MCI's analog switching equipment are a significant element of the charge, Tobin said, claiming, however, that MCI is "writing the equipment down, not off" and that it will continue to use the analog switches with analog-to-digital modems even after converting entirely to digital transmission.

A third element is the cost of cutting 2,300 jobs, many of which were made obsolete by technology, Tobin said. "We cut the number of our surveillance centers from 10 to three because digital technology allows us to monitor remote sites over far greater distances than we can with microwave-based networks."

MCI's cuts and write-downs may be less effective than the company claims, said Phil Sirlin, a research analyst at Sanford C. Bernstein & Co. "No one realized how tough this industry would be for communications carriers other than AT&T and how much AT&T could cut its cost structure," he said.

> ”
>
> ***MCI is 'writing [analog switching] equipment-down, not off.'***
>
> — Gary Tobin
> MCI Communications Corp.

Flexible admits false reporting

From page 154

about $1.2 million.

The company is currently looking at a variety of options, a spokesman said.

"I can't say if our announcement was in response to the *Barron's* article, but as far as I know, we are not in trouble with the SEC or facing penalties for wrong reporting," the spokesman said. The company plans to clarify its position with another announcement in the near future, he said.

While Flexible says it is looking for additional financing to bail it out, its chances of finding it are going to be tough in a market full of contenders in the parallel processing marketplace, according to senior technology analyst Jeffry Canin of Hambrecht & Quist, Inc. in San Francisco.

"They have been a little guilty of enhancing reality," Canin said about Flexible's reported exaggeration of contract values.

Apollo, Sun still gaining; some say profits to continue

ACTIVE ISSUES
Kathy Porteus

One of the more active areas in technology stocks recently has been technical workstation companies, notably Apollo Computer, Inc. (APCI — 14¾) and Sun Microsystems, Inc. (SUNW — 22⅛).

Helped along by strong September quarter reports, Apollo's stock has climbed 14%, and Sun has soared 36% from mid-October prices of 12⅞ and 16½, respectively. Sun also recently completed issuing 4.15 million additional shares of common stock valued at 19⅜.

After such upward moves, investors may wonder if there is room for further gains in the near-term. At least two analysts say there is.

Robert Herwick, an analyst with Hambrecht & Quist, Inc., currently recommends both stocks because "the market for 32-bit technical workstations priced under $20,000 is still relatively unsaturated." Apollo's DN3000 and Sun's 3/50 and 3/110 workstations effectively address this segment, Herwick says.

Both Sun and Apollo have been launching new products this year, a fact reflected in the impressive revenue gains reported in their September quarters. Apollo's new products include its hot-selling DN3000 workstation, DN570/580 Turbo workstations and support, albeit late, of industry standards such as Unix and Ethernet. Among Sun's notable new products are the 3/110, a low-cost color workstation, and the high-end 3/200 workstation series.

Although competition is expected to intensify, the workstation market can currently accommodate the leading players, Herwick says. "If Digital Equipment Corp.'s Microvax business were a separate business," Herwick says, "I would be recommending that too."

Another analyst recommending purchase of both Apollo and Sun is David Wu of S. G. Warburg & Co. "The reason why these companies are doing so well," Wu says, "is that they emerged from the shakeout in the workstation business as the only independent vendors with any clout." According to Wu, Sun has trouble keeping pace with customer demand, and Apollo is staging a comeback partly through success of its DN3000 workstation and strength of foreign sales. "Furthermore," Wu says, "IBM is now less of a competitive threat because of the unenthusiastic response to its RT Personal Computer."

Herwick and Wu estimate Apollo will earn 25 to 30 cents per share in fiscal 1986, ending Dec. 31. Herwick estimates Apollo will earn 85 cents per share next year, while Wu sees company earning $1 per share. According to Wu, relatively low earnings have kept a lid on Apollo's stock movements. "You must believe in big numbers for next year to believe in the stock," he says.

By contrast, Sun's earnings have rapidly grown along with revenue. In its September quarter, Sun reported earnings of 24 cents per share on sales of $91.6 million. Herwick and Wu estimate Sun's earnings in fiscal 1987, ending June 30, will be $1.15 and $1.10 per share, respectively.

Not everyone, however, is convinced the move in Sun and Apollo's stock will continue. While acknowledging Sun and Apollo's positive market conditions and product momentum, Frederic Cohen of L. F. Rothschild, Unterberg Towbin says both stocks are fairly valued at current price levels. "These stocks are selling at much higher price/earnings ratios than they were four weeks ago," Cohen says. "We haven't raised our estimates, so we must consider the relative valuation of these companies."

Cohen estimates Sun will earn $1 to $1.05 per share and Apollo, 75 cents per share in their respective 1987 fiscal years. He says he still believes Sun is a very exciting long-term holding.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

TI fostering Asian alliances

From page 154

point where American companies are competing with large, vertically integrated Far East manufacturers, and they've got to figure out new ways to compete and/or work together to remain viable in the 1990s," Victor said.

Sick had been developing contacts overseas in his position as semiconductor president, according to Victor.

"But there was only so much time that could be devoted to that when he had other work to do, and now he'll be doing it full time," Victor said, declining to give specifics on any negotiations.

The fact that TI underlined the importance of this management change is significant in itself, according to Michael Gumport, a semiconductor analyst with Drexel Burnham Lambert, Inc.

"Most of the time management changes are not really noteworthy, and TI went out of their way to state that this was an important realignment," Gumport said.

"So you can expect some major action within a year in terms of joint ventures and minority interests," he continued, "most likely with an equipment or components manufacturer."

MITCHELL J. HAYES

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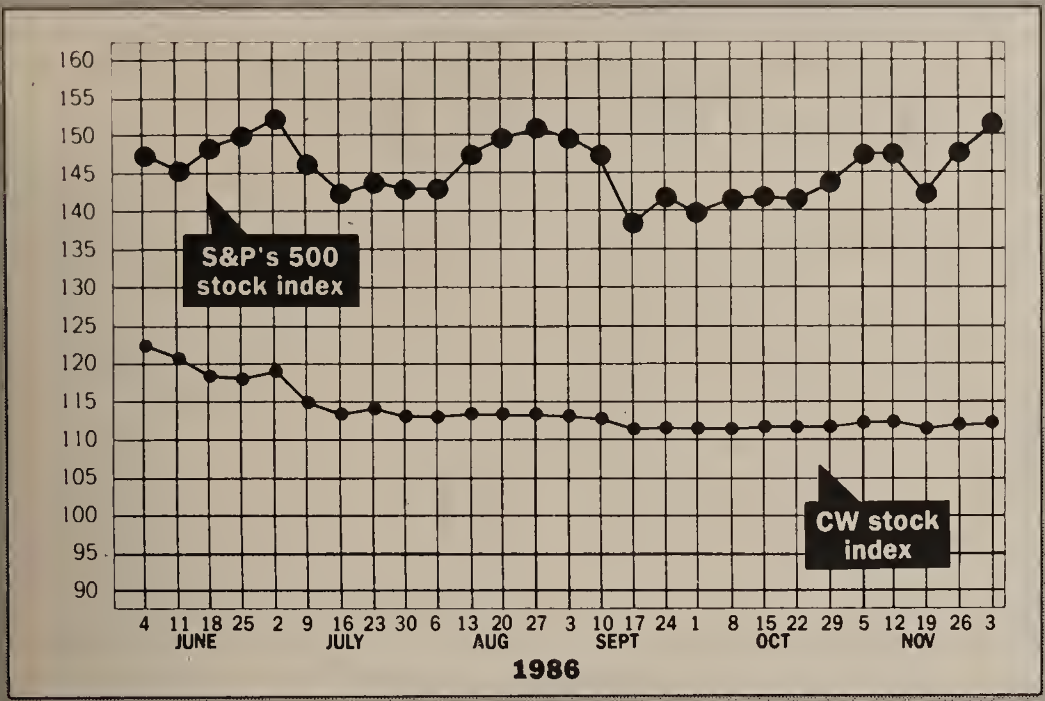

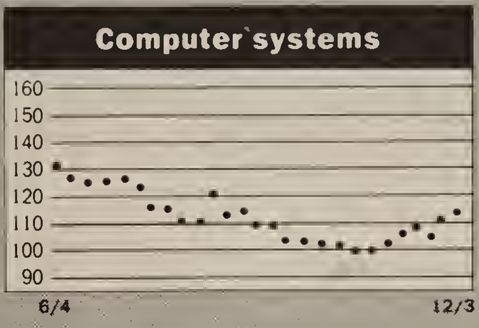
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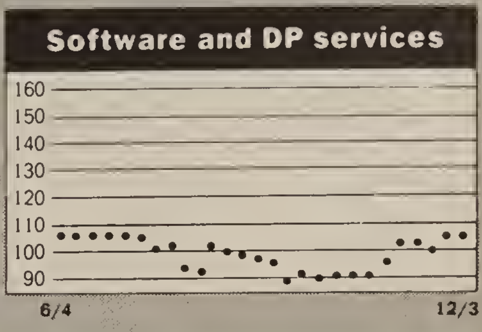
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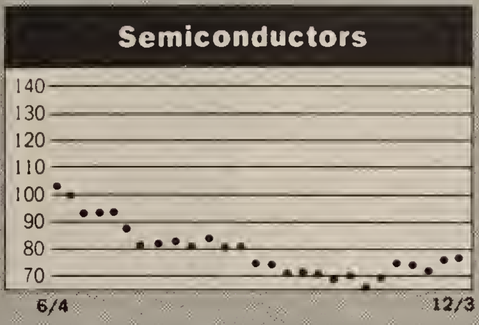
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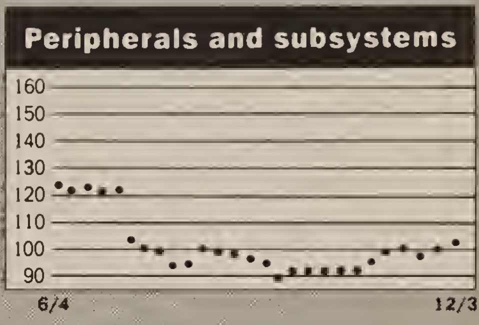
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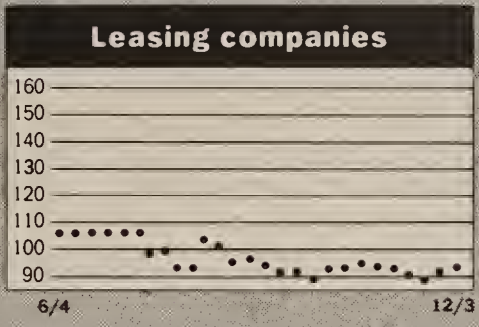
Standard and Poor's 500 stock index	148.4	**151.8**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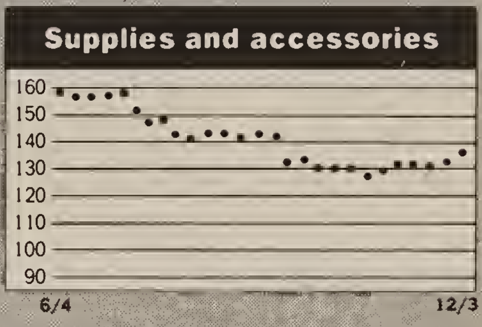
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O	ALTOS COMPUTER SYS	19	10	11.88	+1.0	+9.2
A	AMOAHL CORP	23	13	22.25	+0.4	+1.7
O	APOLLO COMPUTER INC	18	9	14.50	+0.5	+3.6
O	APPLE COMPUTER INC	43	19	42.75	+2.5	+6.2
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A	COMPUTER CONSOLES INC	12	6	9.00	+0.1	+1.4
O	CONCURRENT COMP CORP	25	1	15.75	-0.3	-1.6
N	CONTROL DATA CORP	29	18	26.13	+0.4	+1.5
O	CONVERGENT TECH	14	4	6.50	+0.1	+2.0
N	CRAY RESH INC	100	57	79.00	+4.5	+6.0
O	DAISY SYS CORP	32	8	9.75	+0.4	+4.0
N	DATA GEN CORP	50	25	32.63	-0.6	-1.9
N	DATAPOINT CORP	9	5	7.13	-0.3	-3.4
N	OIGITAL EQUIP CORP	108	61	107.38	+1.9	+1.8
N	FLOATING POINT SYS INC	46	11	12.25	-0.3	-2.0
N	GOULO INC	34	15	18.63	-0.3	-1.3
N	HARRIS CORP	37	26	31.75	+1.3	+4.1
N	HEWLETT PACKARD CO	50	35	44.75	+0.3	+0.6
N	HONEYWELL INC	87	62	69.00	-1.4	-2.0
N	IBM	162	119	128.63	+1.5	+1.2
O	IPL SYS INC	4	1	2.38	-0.1	-5.0
N	ITT CORP	60	34	55.75	+0.8	+1.4
N	M A COM INC	19	12	13.00	+0.1	+1.0
N	MATSUSHITA ELEC INDL LTD	124	57	123.38	+8.4	+7.3
O	MENTOR GRAPHICS CORP	21	11	17.38	+0.3	+1.5
N	NBI INC	14	8	10.00	-0.3	-2.4
N	NCR CORP	57	37	48.75	-0.1	-0.3
N	PRIME COMPUTER INC	28	16	18.25	+0.6	+3.5
O	STRATUS COMPUTER	26	17	21.75	+0.8	+3.6
O	SYM8OLICS INC	16	4	4.25	-0.1	-2.9
O	TANDEM COMPUTERS INC	40	19	38.38	+0.6	+1.7
N	TANOY CORP	45	31	43.00	+0.5	+1.2
N	TEXAS INSTRS INC	148	103	123.25	+4.4	+3.7
A	ULTIMATE CORP	35	13	19.75	+2.4	+13.7
N	UNISYS	86	58	85.75	+5.8	+7.2
A	WANG LA8S INC - 8	23	11	13.00	+0.4	+3.0
A	WANG LABS INC - C	23	11	13.00	+0.5	+4.0
N	XEROX CORP	72	49	61.00	+1.3	+2.1

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC 3 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER 8USINESS PRODS	37	23	24.00	+0.1	+0.5
N	8ARRY WRIGHT CORP	25	14	15.63	+0.5	+3.3
A	DUPLEX PRODS INC	23	18	18.88	-0.1	-0.7
N	ENNIS 8USINESS FORMS INC	28	21	26.75	+1.5	+5.9
N	3M CO	116	85	114.13	+1.1	+1.0
N	MOORE LTD	28	19	21.75	+1.1	+5.5
O	STANDARO REGISTER CO	50	32	37.50	+1.5	+4.2
N	WALLACE COMPUTER SVCS	50	37	41.75	+1.4	+3.4

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE OEC 3 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCEO COMP TECH	7	4	4.88	+0.3	+5.4
N	AOVANCED SYS INC	19	12	16.00	+0.5	+3.2
N	AGS COMPUTERS INC	28	17	27.50	+2.3	+8.9
O	AMERICAN MGMT SYS INC	22	11	21.25	+1.8	+9.0
O	AMERICAN SOFTWARE INC	17	9	16.50	+1.5	+10.0
N	ANACOMP INC	7	3	4.13	+0.3	+6.5
O	ANALYSTS INTL CORP	9	4	9.25	+1.0	+12.1
O	ASHTON TATE	47	17	44.50	-1.5	-3.3
O	ASK COMPUTER SYS INC	15	9	11.88	+0.0	+0.0
O	ASTRADYNE COMP INO	3	1	1.94	-0.4	-16.2
N	AUTOMATIC DATA PROC	39	28	36.50	+0.3	+0.7
O	BOOLE & BABBAGE INC	7	4	5.75	-0.3	-4.2
O	COMPUTER ASSOC INTL INC	25	14	22.75	+0.0	+0.0
O	COMPUTER HORIZONS CORP	15	10	9.88	-0.6	-6.0
O	COMPUTER NETWORK TECH	10	3	4.94	+0.6	+14.5
N	COMPUTER SCIENCES CORP	44	28	43.75	+2.8	+6.7
O	COMPUTER TASK GROUP INC	19	11	12.25	-0.3	-2.0
O	COMPUTONE SYS INC	6	0	0.31	-0.1	-28.5
O	COMSHARE INC	16	10	13.00	-1.3	-8.8
N	CULLINET SOFTWARE INC	20	6	8.00	-0.5	-5.9
O	CYCARE SYS INC	17	8	8.38	-0.1	-1.5
O	DUQUESNE SYS INC	33	14	35.38	+0.6	+1.8
N	GENERAL ELEC CO	89	65	88.50	+4.8	+5.7
N	GENERAL MTRS CORP	50	26	28.25	-3.1	-10.0
O	HOGAN SYS INC	12	6	11.50	+0.1	+1.1
O	INFORMATION SCIENCES INC	4	1	1.75	+0.0	+0.0
O	INFOTRON SYS CORP	19	8	10.75	+0.0	+0.0
O	KEANE INC	16	6	6.00	+0.0	+0.0
N	LOGICON INC	43	23	23.50	-1.5	-6.0
O	LOTUS OEV CORP	56	20	55.50	+0.3	+0.5
O	MANAGEMENT SCI AMER	16	10	13.63	+0.8	+5.8
O	MCI COMM CORP	13	6	7.13	+0.5	+7.5
O	MICOM SYS INC	23	10	14.25	+0.8	+5.6
O	MICRO PRO INTL CORP	4	2	2.50	+0.3	+11.1
O	MICROSOFT CORP	51	26	48.63	-2.4	-4.7
O	NATIONAL OATA CORP	26	16	22.38	+0.9	+4.1
O	ON LINE SOFTWARE INT	16	7	14.00	+0.8	+5.7
O	ORACLE SYS CORP	29	13	19.50	-2.1	-9.8
N	PANSOPHIC SYS INC	36	23	26.88	-0.6	-2.3
O	POLICY MGMT SYS CORP	24	15	23.50	+1.0	+4.4
O	PROGRAMMING & SYS INC	11	8	9.13	+0.1	+1.4
O	REYNOLDS & REYNOLDS CO	42	24	29.50	+1.3	+4.4
O	SCIENTIFIC COMPUTERS INC	6	4	4.63	+0.0	+0.0
O	SEI CORP	28	15	19.25	+0.3	+1.3
O	SHAREO MEO SYS CORP	41	29	39.38	+1.8	+4.7
O	SOFTWARE AG SYSTEMS INC	22	12	11.88	-3.4	-22.1
O	SOFTWARE PU8G CORP	10	5	7.75	-0.6	-7.5
A	STERLING SOFTWARE INC	21	9	13.00	-1.9	-12.6
N	SUNGUARD DATA SYSTEMS	16	10	13.75	+1.3	+10.0
N	UCCEL CORP	26	15	25.38	+0.1	+0.5
N	URS CORP	18	10	16.63	-1.3	-7.0
O	VM SOFTWARE INC	32	18	29.50	+1.0	+3.5

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE OEC 3 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOVANCED MICRO DEV	34	13	16.13	+0.4	+2.4
N	ANALOG DEVICES INC	25	14	16.00	+0.5	+3.2
O	ANALOGIC CORP	16	10	11.50	+0.5	+4.5
N	APPLIED MAGNETICS CORP	20	13	16.38	+0.0	+0.0
O	AVANTEK INC	23	15	14.88	-0.6	-4.0
O	HADCO CORP	7	3	4.00	+0.3	+6.7
O	INTEL CORP	32	16	23.00	+0.8	+3.4
O	MICRO MASK INC	7	2	2.75	-0.3	-8.3
N	MOTOROLA INC	50	34	39.50	+1.1	+2.9
N	NATIONAL SEMICONDUCTOR	16	8	11.50	+0.0	+0.0
N	TERAOYNE INC	30	16	17.63	+0.1	+0.7

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE OEC 3 1986	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	5	6.88	+0.6	+10.0
A	ANOERSON JACOBSON INC	3	1	1.25	-0.2	-13.1
O	AST RESH INC	33	11	12.88	+1.1	+9.6
O	AUTOTROL CORP	10	6	6.50	+0.8	+13.0
O	AVANT GARDE COMPUTING	7	3	4.75	+0.5	+11.8
O	BANCTEC INC	13	6	9.50	+0.0	+0.0
N	BOLT BERANEK & NEWMAN	48	34	44.00	+1.0	+2.3
A	CETEC CORP	9	5	5.38	-0.3	-4.4
A	COGNITRONICS CORP	6	2	2.50	+0.0	+0.0
N	COMPUGRAPHIC CORP	29	16	20.38	+0.6	+3.2
N	COMPUTERVISION CORP	19	10	14.88	-0.3	-1.7
N	CONRAC CORP	18	13	13.63	+0.3	+1.9
A	OATAPROOUCTS CORP	18	12	12.63	+0.8	+6.3
A	DATARAM CORP	18	7	7.00	+0.0	+0.0
O	OATA SWITCH CORP	9	5	6.38	-0.1	-1.9
O	OATUM INC	7	4	5.00	+0.1	+2.6
N	OECISION INOS CORP	15	8	9.50	-0.1	-1.3
O	EMC CORP	8	3	6.38	+0.1	+2.0
O	ENDATA INC	18	8	16.50	+0.3	+1.5
O	EVANS & SUTHERLANO	29	18	26.75	+0.3	+0.9
N	FLOATING POINT SYS INC	46	11	12.25	-0.3	-2.0
O	GANOALF TECHNOLOGIES	8	5	6.50	+0.0	+0.0
N	GENERAL DATACOMM IND	15	8	8.50	-0.3	-2.9
N	HAZELTINE CORP	30	16	29.75	-0.1	-0.4
O	ICOT CORP	13	7	9.13	-0.1	-1.4
O	INFORMATION INTL INC	18	13	14.00	-0.3	-1.8
O	INTECOM INC	7	3	5.31	+0.0	+0.0
O	INTERLEAF INC	15	8	10.25	-0.3	-2.4
O	MEGAOATA CORP	5	2	3.00	+0.3	+9.1
A	MSI OATA CORP	14	8	11.38	-0.6	-5.2
N	NASHUA CORP	28	13	24.13	+0.9	+3.8
O	NETWORK SYS CORP	25	10	14.00	+2.3	+19.1
N	NORTH AMERN PHILIPS CORP	48	35	38.75	-0.4	-1.0
N	NORTHERN TELECOM LTD	38	25	32.13	+0.1	+0.4
O	NOVELL INC	26	14	25.00	-0.3	-1.0
N	PARAOYNE CORP	11	4	4.50	-0.4	-7.7
A	PENRIL CORP	9	4	4.63	+0.3	+5.7
N	PLESSEY PLC	38	22	24.00	-0.3	-1.0
O	PRINTRONIX INC	15	11	11.88	+0.0	+0.0
O	QMS INC	16	9	15.00	+0.6	+4.3
O	RAMTEK CORP	7	3	4.88	-0.1	-2.5
N	RECOGNITION EQUIP INC	17	10	13.50	+1.1	+9.1
O	SCAN TRON CORP	19	10	15.75	+1.0	+6.8
N	SCIENTIFIC ATLANTA INC	15	9	10.63	+0.5	+4.9
O	SEAGATE TECHNOLOGY	20	6	20.00	+2.0	+11.1
N	STORAGE TECHNOLOGY	7	2	3.75	+1.0	+36.4
O	SUN MICROSYSTEM INC	23	11	22.38	+1.0	+4.7
A	T-BAR INC	8	5	7.63	+0.0	+0.0
A	TAB PROOS CO	15	11	12.13	+0.1	+1.0
O	TANDON CORP	8	2	2.63	-0.5	-16.0
A	TEC INC	7	3	3.88	+0.3	+6.9
N	TEKTRONIX INC	70	52	66.38	-1.4	-2.0
O	TELEVIDEO SYS INC	4	2	2.13	-0.1	-5.6
N	TELEX CORP	70	52	69.50	+2.4	+3.5
N	TIMEPLEX INC	24	14	22.38	+1.0	+4.7
N	TITAN CORP	12	6	7.00	+0.5	+7.7
O	VISUAL TECHNOLOGY INC	1	0	0.38	+0.0	-7.6
O	WYSE TECH	19	11	16.88	+2.1	+14.4

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE OEC 3 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	25	12	18.75	+0.8	+4.2
N	CONTINENTAL INFO SYS	12	6	8.75	+0.0	+0.0
O	FINALCO GROUP INC	5	2	2.50	+0.0	+0.0
O	PHOENIX AMERN INC	6	3	3.88	-0.1	-3.1
O	SELECTERM INC	12	5	5.50	+0.0	+0.0
N	U.S. LEASING	47	35	46.13	+0.9	+1.9

COMPUTER INDUSTRY

INSIDE

Falling earnings and a departed CEO spell an uncertain future for Intelogic Trace/**131**

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The rising yen causes profit drops and spending cutbacks for Japanese high-tech vendors/**134**

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INSTANT ANALYSIS

"We're not going to rip all the factories out of the U.S."

— Jerome J. Meyer, executive vice-president, U.S. Information Systems, Honeywell, Inc., on the future of the business under joint ownership of NEC and Bull

EDS top-level departures should help ties with GM

By Alan Alper

DETROIT — The departure of the four top executives from Electronic Data Systems Corp. (EDS), including founder and Chairman H. Ross Perot, should strengthen the firm's ability to integrate the sundry computer systems of parent General Motors Corp., analysts said last week.

The removal of Perot, who has publicly criticized GM, should ease the tension between EDS and GM management, which has crimped EDS's ability to solve pressing systems integration problems at its parent company, analysts said. GM also folded EDS into a business unit consisting of GM's high-technology defense and electronics operations under Executive Vice-President Donald Atwood, a move that analysts say would also further GM's corporate objectives.

H. Ross Perot

"In the short run, this move should make EDS a more effective force in the integration process at GM," noted Ted Jastrzembski, director of software research programs at International Data Corp., a market research firm in Framingham, Mass. "The divisiveness as a result of the culture clash between Perot and his people and GM should be lessened as a result of this."

Jastrzembski said the challenge facing EDS's Lester M. Alberthal Jr., who succeeds Perot as chief executive officer of EDS, is to strike a careful balance between the company's work at GM in computer-integrated manufacturing and data processing areas and its desire to be the No. 1 alternative to IBM

See **EDS** page 152

MCI reduces spending, cuts staff

By Elisabeth Horwitt

WASHINGTON, D.C. — MCI Communications Corp. last week announced major layoffs, reductions in capital spending and equipment write-downs that would result in a fourth-quarter loss.

While MCI spokesmen claimed that the short-term loss would ensure the company's long-term profitability, some analysts attributed the moves to the second largest telephone company's losing struggle to hold its own against market pressures and archrival AT&T.

Last Wednesday, MCI announced it would take a fourth-quarter pretax charge of $500 million to $700 million, consolidate some of its operations and significantly reduce capital spending, beginning with cuts of more than $100 million in 1987.

The following day, the company revealed it would lay off approximately 15% of its 16,000 employees, primarily as a result of its effort to consolidate net management, customer service, warehouse, telemarketing and administrative staffs.

A significant portion of the one-time charge — approximately 40%, one analyst estimated — related to the company's write-down of satellite equipment, much of it belonging to MCI subsidiary Satellite Business Systems (SBS), MCI President Bert Roberts told a group of analysts.

Transponders that were purchased for SBS satellites in 1982 at a market rate of $110,000 per transponder are now worth $25,000 to $35,000, Roberts said. The transponders are further devalued because MCI has moved all of the voice traffic the company once supported down to its terrestrial network.

"As everything becomes digital, satellites' ability to support digital transmission is no longer a real advantage," said

See **MCI** page 152

INDUSTRY INSIGHT
Clinton Wilder

Perot wins . . . again

H. Ross Perot is one of those individuals who always has to have the last word. Last week, he succeeded — and in doing so, won a major public relations coup against the world's largest corporation.

Through whatever combination of ego and astuteness, Perot correctly sized up the public and general press perception of his ongoing feud with the top brass of General Motors Corp., specifically Chairman Roger Smith. He ostensibly agreed to the GM board's plan to buy his stock and his silence for a cool $750 million — but not without twisting the plot to his advantage one final time.

Correctly sensing that the cauldron of GM shareholder and employee opinion would be brought to a boil in reaction to the buy-out plan, Perot concocted a scheme to let the pot simmer for two more weeks. He agreed to leave the GM board and the functional leadership of Electronic Data Systems Corp. (EDS), but he gave the GM honchos until Dec. 15 to really think it through — just in case they change their minds.

With that maneuver, Perot could succeed in creating a pressure cooker for the GM board that is much more uncomfortable than the heated criticism he has been personally supplying them for the last several months. Within hours of Perot's announcing that he would put his millions in escrow for the moment, some of GM's largest institutional shareholders, as well as many analysts,

See **PEROT** page 135

Wilder is Computerworld's *senior editor, computer industry.*

Flexible admits false reporting

Dallas computer firm reveals financial woes

By Donna Raimondi

DALLAS — Flexible Computer Corp. issued a terse notice last week admitting that it reported revenue falsely and is now experiencing a severe working capital shortage with limited prospects of relief.

In addition, Flexible said it is in default on certain creditor obligations.

The company has admitted that it "recognized revenue on certain shipments prior to the time that all significant obligations were satisfied." As a result, Flexible will restate its previously reported results of operations and related financial statements for 1985 and 1986.

The announcement appeared to be in response to a Nov. 24 article published by financial newspaper *Barron's*. Flexible was exposed in the article for issuing misleading press releases that made it look like companies and government agencies had bought millions of dollars' worth of Flexible systems, when in fact they had only signed agreements guaranteeing discounts if they did decide to buy.

Barron's also reported that Flexible sold its stock substantially below market value to some of its largest investors — one of whom is known to have been disciplined by the Securities and Exchange Commission (SEC) for previous insider trading. The article also stated that Flexible has reported $6.7 million in lifetime revenue, when it has actually pocketed

See **FLEXIBLE** page 152

TI creates position to develop alliances with Asian chip makers

By James A. Martin

DALLAS — Texas Instruments, Inc. said last week it had created a new position in its semiconductor group to develop stronger business alliances with Asian and Pacific chip manufacturers and customers.

The announcement was seen by analysts as the latest move by a U.S. semiconductor company to find joint partnerships in Japan and Asia.

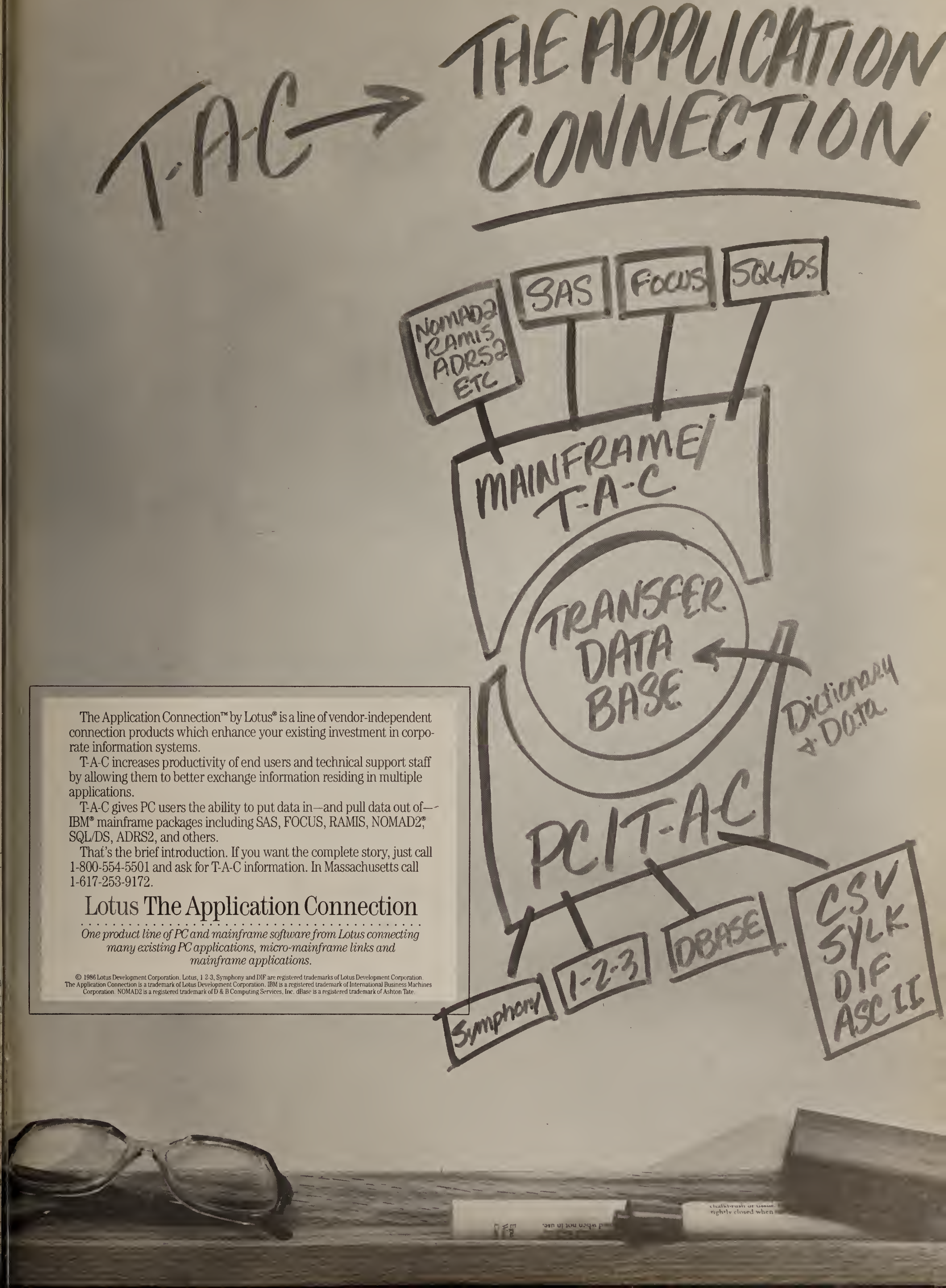
William N. Sick, TI's executive vice-president and semiconductor president, will assume full-time responsibility for developing business alliances with other semiconductor manufacturers in Asia and the Pacific region beginning Jan. 1.

TI has been looking at such partnerships for more than a year as a result of the depressed semiconductor industry, according to Stan Victor, a TI spokesman. In order for U.S. companies to survive, there needs to be a realization that "it's no longer business as usual," he added.

In October, Tokyo-based Fujitsu Ltd. announced merger plans with Sunnyvale, Calif.-based Fairchild Semiconductor Corp. The merger has been questioned by U.S. chip companies, which expressed concern about increasing Japanese interests in U.S. companies, and by the Reagan administration, which fears there might be national security risks. In addition, Toshiba Corp. recently announced a joint venture with Motorola, Inc. [CW, Nov. 24].

"The electronics and semiconductor industries have changed to the

See **TI** page 152



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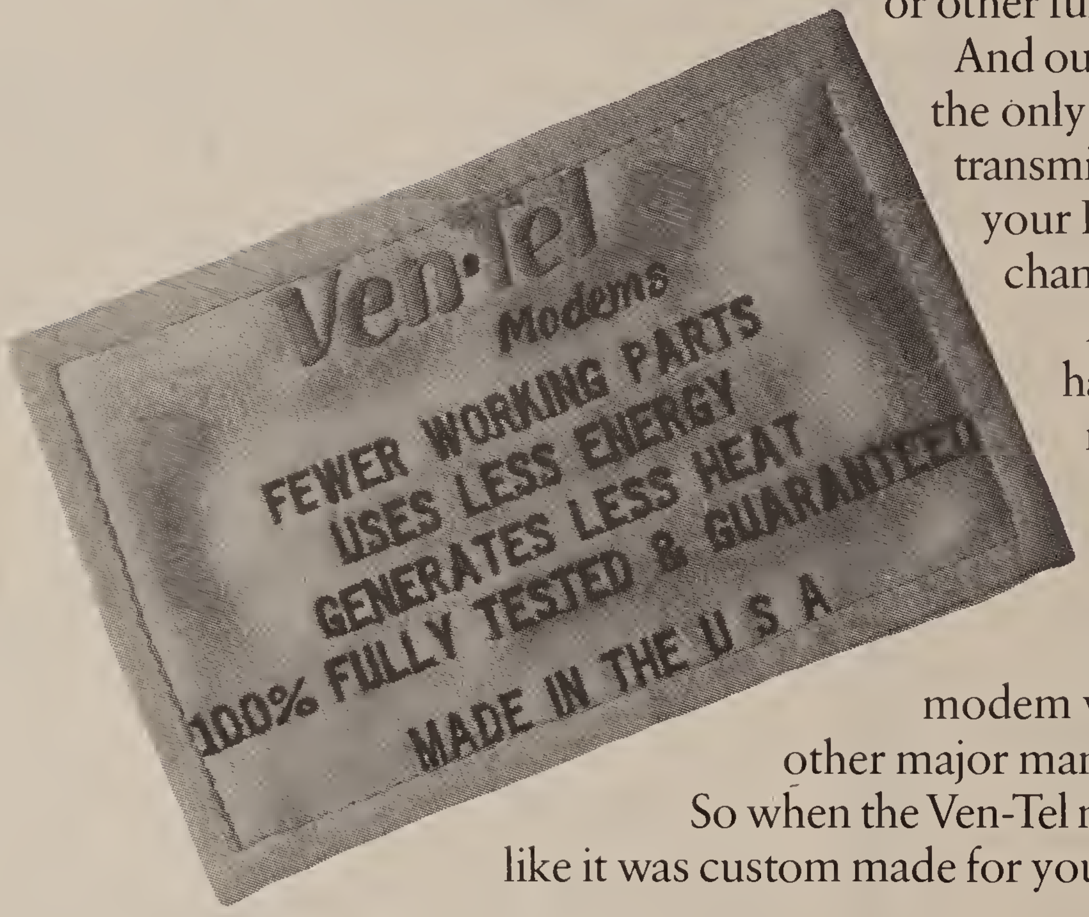

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